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STATISTICS OF COLLEGE AND NON-COLLEGE WOMEN.

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The oldest women college graduates are now about 65 years of age; until 1880, however, women did not go to college in any considerable numbers. Time enough has only just elapsed, therefore, to make statistics of marriage and child bearing possible. An acquaintance with several thousand college women and their families, and a residence in five colleges of different types, extending over a period of thirty years, has given the writer an opportunity of hearing all phases of women's education discussed. It can scarcely have failed to give a background for the interpretation of statistics bearing upon the comparative results of the generally prevalent systems of education for women. The following data have been collected, with the approval of the Association of Collegiate Alumnæ, a body of over 2000 women, of whom more than 600 are married. The inquiry has not been limited exclusively to them, but includes women graduates of other colleges than those admitted to membership. Heretofore the college women have been compared with that vague standard, the "average" women of the Census;

it is just to compare them only with women of the same social class, and of approximately the same age, who have been educated in other ways. For the controversy is no longer as to *whether* a woman shall be educated, but as to *how* she shall be educated.

The object of this paper is to show, so far as can be shown by the statistical method, whether college women differ as to age of marriage, child-bearing capacity, health, income, and the class of men they marry, from their sisters, cousins, and friends who were educated in other ways. Many other facts would have been interesting to ascertain, but it was deemed wiser to make the schedule so simple that even the busy mothers of young children would reply. Certain physiological questions were omitted in order not to tresspass upon another and more extended inquiry which was begun some time ago by another investigator.

In order to avoid clumsy repetition the college women will be referred to throughout the paper as Class A, and the non-college women as Class B.

The tabulations and diagrams were made by Mr. Walter E. Nichols, Stanford, '99, a student of social statistics, to whom I am indebted also for many valuable suggestions. The schedule blank used was as follows: —

1. Where was your academic, collegiate, or later education obtained?
   Degrees, if any? Honors or scholarships, if any?
2. At what age did you marry? How long married?
3. How many children have you had?
   (*a*) Now living (sex and age of each)?
   (*b*) Now dead (sex and age of each at death)?
   Cause of death?
   (*c*) Number still-born? Number of miscarriages?
4. Are your children delicate, moderately well, or robust?
   If any are delicate, why?
5. Did you have delicate, fair, good, or robust health before marriage?
   If delicate or fair only, was there any *special* cause for it?
6. Do you have delicate, fair, good, or robust health now?
   If this reply varies from question 5, to what do you attribute the change?

7. Where was your husband's later education obtained?
   Degrees, if any?
   What is your husband's occupation?
8. What was your own occupation before marriage?
   How many years pursued?
9. Is your average yearly joint income less than $2000?
   Between $2000 and $5000? Over $5000?
10. Do you live in city, suburbs, or country?

TABLE I—A.

THREE HUNDRED AND FORTY-THREE COLLEGE-BRED MARRIED WOMEN, BY INSTITUTIONS, WITH DEGREES, HONORS, FELLOWSHIPS, AND SCHOLARSHIPS.

Name of Institution.	Bachelor's Degrees.	Master's Degrees.	Doctors of Philosophy.	Doctors of Medicine.	Honors.	Fellowships.	Scholarships.
Boston University	15	2	..	..	1	..	5
Brown University	..	1	..	..	..	..	.
Bryn Mawr College	6	2	..	..	..	3	2
California, University of	13	1	..	..	1	..	1
Chicago, University of	..	2	2	1	..	6	..
Colorado, University of	1	..	..	..	..	..	..
Columbia University	1	..	..	..	..	..	..
Cornell University	23	5	(D.Sc.) 1	..	8	1	3
Iowa, University of	1	..	..	..	..	..	..
Johns Hopkins University	..	..	..	..	..	1	..
Kansas, University of	5	2	..	..	2	..	..
Leland Stanford Jr. University	3	..	1	..	..	..	..
Mass. Institute of Technology	4	..	..	..	1	..	..
Michigan, University of	20	2	2	1	3	..	..
Nebraska, University of	1	..	..	.	1	..	..
Northwestern University	7	3	..	1	1	..	..
Oberlin College	16	2	..	..	1	..	..
Ohio Wesleyan University	1	..	..	..	1	..	..
Pennsylvania, University of	..	1	..	(D.D.S.) 2	..	..	..
Radcliffe College	6	..	..	..	..	1	..
Smith College	44	5	1	..	1	..	..
Syracuse University	11	9	3	..	5	..	..
Vassar College	83	8	..	..	15	..	2
Vermont, University of	1	..	..	..	1	..	..
Wellesley College	50	6	..	..	1	..	..
Wisconsin, University of	20	2	..	..	8	2	..
Woman's Medical College (N. Y.)	..	..	..	1	..	..	..
Woman's Medical College (Phila.)	..	..	..	1	..	..	..
Gottingen, Berlin	..	..	(LL.D.) 1	..	..	..	..
Zürich	..	1	..	..	..	..	..
Totals	332	54	11	7	51	14	13

Table I—A gives in detail by institutions the degrees, honors, fellowships, and scholarships taken by Class A; eleven women took the bachelor's degree at institutions not to be ranked in this list, but a master's degree taken later entitled them to be counted in Class A. Of the total number 15 per cent took master's degrees, 23 per cent took honors or held fellowships and scholarships; 53 per cent took their bachelor's degree at one of four women's colleges (Vassar, Wellesley, Smith, Bryn Mawr), and 41 per cent at sixteen co-educational institutions ranging in location from Boston University to the University of California.

TABLE I—B.

THREE HUNDRED AND THIRTEEN NON-COLLEGE MARRIED WOMEN: SISTERS AND COUSINS NEAREST IN AGE, AND INTIMATE FRIENDS OF TABLE A, BY SCHOOLS, ETC.

Schools and Other Educational Institutions.	Sisters.	Cousins.	Friends.	Total.
Academy	7	8	16	31
Advanced art study	4	..	6	10
Advanced music study	7	..	9	16
Chautauqua course	1	..	2	3
High school	22	17	50	89
Other public schools	13	8	23	44
Manual training	1	..	1	2
Normal school	3	3	8	14
* Partial college course	7	1	20	28
Private schools	23	11	58	92
Private Teachers	4	1	11	16
Seminary	10	4	21	35
Travel	..	2	7	9
Totals	102	55	232	389
Unknown	..	..	..	8

* This includes those who attended college only a year, and those who attended colleges of a rank not higher than seminaries or normal schools.

Table I—B shows similar facts concerning 313 married women, sisters and cousins nearest in age, and friends of Table A, who did not go to college, but were educated in other ways. Of these, 305 give their education in 389 dif-

FIG. II C.

Percentage of Women marrying by three different age groups.

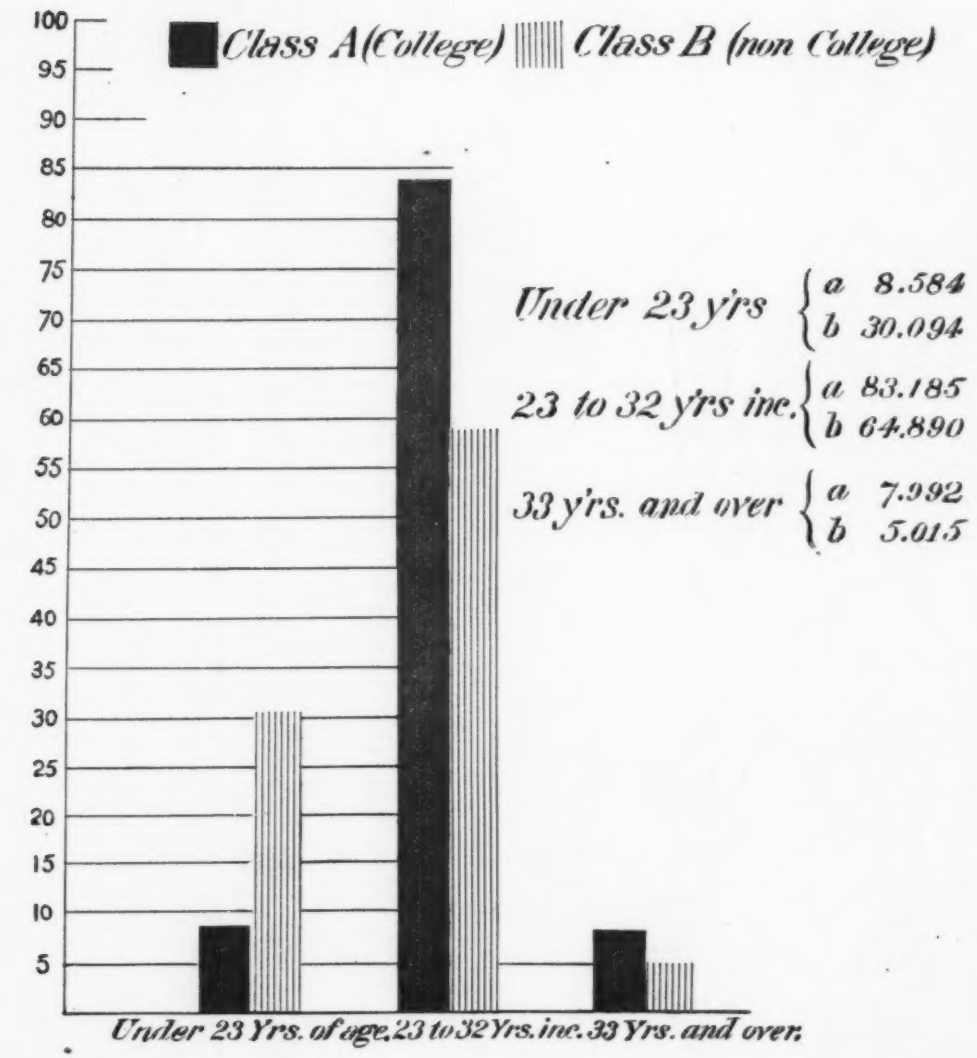
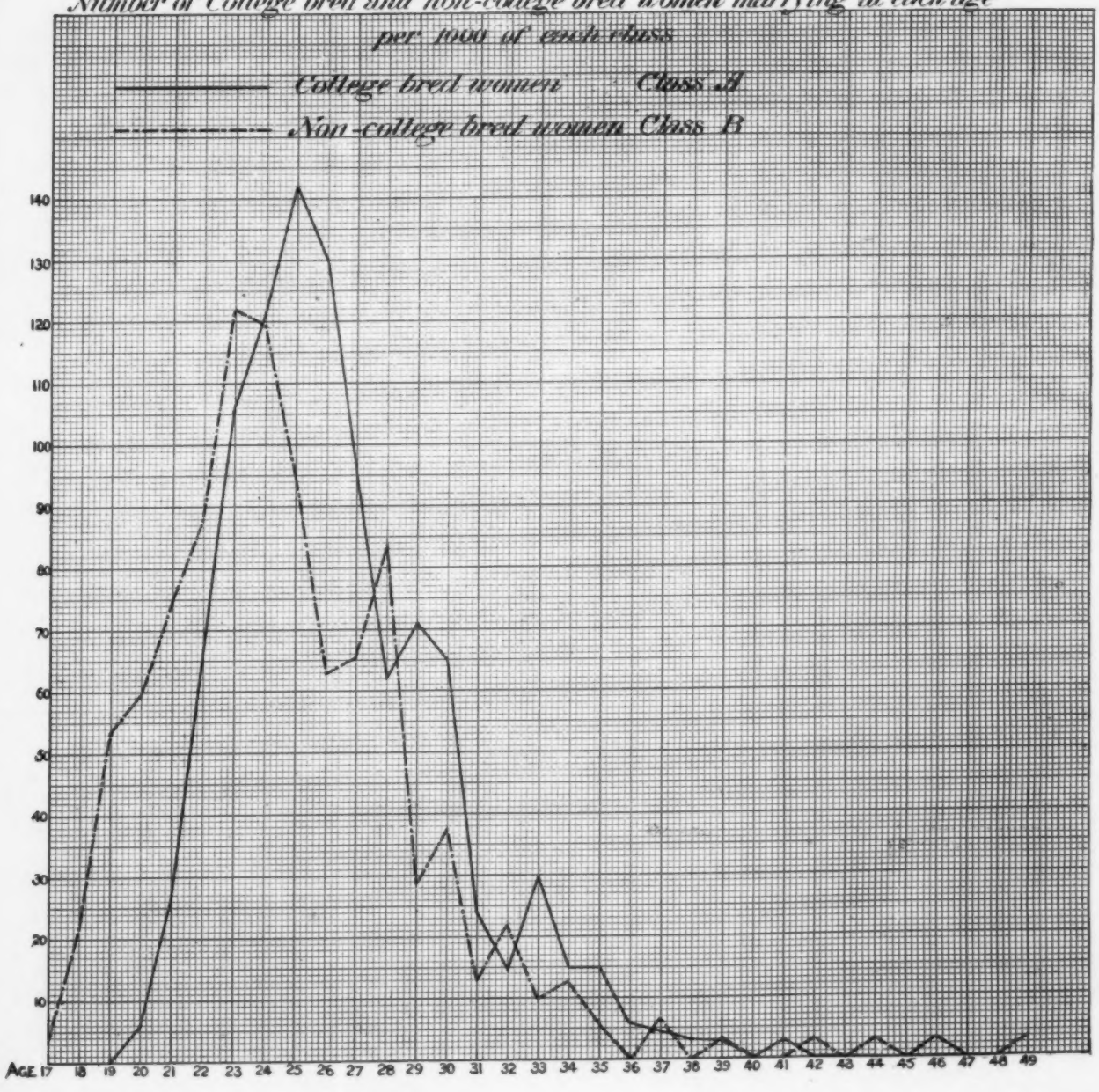


FIG. II A & B

Number of College bred and non-college bred women marrying at each age per 1000 of each class



ferent schools; some were educated partly in a public school and partly by private tutors; others graduated at a high school or a private school, and afterward traveled abroad or studied art or music. If the advanced art and music study and travel be left out of account, the remainder of the 389 educational opportunities are almost exactly divided between public and private schools.

It has generally been supposed that going to college delayed marriage; just how much it does so is shown by Table II—A and B. The mean age of marriage for Class A is 26.3 years; for the sisters, 24.2 years; for the cousins, 24.7 years; and for the friends, 24.2 years; an average for Class B of 24.3 years. Thus it appears that the marriage of a college women is postponed two years as compared with her non-collegiate relatives and friends. The number of the cousins (44) is too small to admit of any inference being drawn from the variation in age at marriage from that of the sisters. The second half of the table illustrates the postponement of marriage in a slightly different way: the average number of years of married life of Class A, 9.6, is three years less than their sisters, 12.6, two years less than their cousins, 11.7, and two and a half years less than their friends, 11.1. Fig. II—A and B illustrates graphically the conclusion reached in the consideration of Table II — A and B; Fig. II — C the same by age groups in still another way.

The postponement of marriage in the case of Class A as well as the percentage of women married at each age up to 37 in both classes is shown in Table II — C. Only 2 women of Class A married before 21 years of age, while 17 sisters, 2 cousins, and 25 friends, or 8 per cent of Class B, married before that age. After that, Class A steadily gains on Class B in the proportion marrying at each age, until between 33 and 34, 94 per cent of each class is married; after 34, Class A slightly surpasses Class B.

Table II — C shows not only that Class B married earlier than Class A but also that the non-college relatives and

TABLE II—A AND B.

NUMBERS AND TOTAL YEARS OF MARRIED LIFE OF WOMEN OF BOTH CLASSES MARRYING AT SPECIFIED AGES.

Age at Marriage.	Number Women Marrying at a Specified Age.				Total Number of Years of Married Life of Women Marrying at a Specified Age.			
	College (Class A).	Non-College. (Class B.)			College (Class A).	Non-College (Class B).		
		Sisters.	Cousins.	Friends.		Sisters.	Cousins.	Friends.
17	..	1	..	..	....	25.00	....	....
18	..	3	..	4	....	88.00	....	70.00
19	..	7	1	9	....	117.50	21.00	156.33
20	2	6	1	12	47.33	107.50	18.00	247.50
21	9	10	3	11	86.50	176.00	54.00	149.58
22	18	7	5	16	214.67	88.00	69.58	198.40
23	36	6	5	28	441.50	82.00	56.50	276.33
24	41	8	10	20	517.20	49.20	150.00	214.30
25	48	11	6	13	520.20	116.10	51.50	115.20
26	44	3	1	16	334.00	27.50	5.00	190.20
27	32	4	4	13	265.30	38.00	45.00	164.20
28	21	3	..	24	167.20	51.00	....	156.90
29	24	2	1	6	189 50	9.00	2.50	41.00
30	22	4	1	7	167.90	29.50	7.00	50.70
31	8	2	1	1	74.20	9.00	9.00	11.00
32	5	4	1	2	48.50	24.20	14.00	13.00
33	10	1	..	2	109.50	8.00	....	34.00
34	5	..	1	3	25.60	....	4.50	17.80
35	5	1	..	1	45.20	6.00	....	15.00
36	2	..	..	..	2.50	....	....	....
37	2	..	1	1	8.70	....	4.00	6.50
38	1	..	..	..	6.50	....	....	....
39	1	..	..	1	9.00	....	....	3.00
40	..	..	..	..	....	....	....	....
41	1	..	..	..	1.00	....	....	....
42	..	..	1	..	....	....	1.50	....
43	..	..	..	..	....	....	....	....
44	..	..	..	1	....	....	....	2.00
45	..	..	..	..	....	....	....	....
46	..	..	..	1	....	....	....	2.50
47	..	..	..	..	....	....	....	....
48	..	..	..	..	....	....	....	....
49	..	..	1	..	....	....	1.10	....
Totals,	337	83	44	192	3282.00	1051.50	514.18	2135.44
Mean age	26.3	24.2	24.7	24.2	....	....	....	....
Average,	..	..	..	..	9.7	12.6	11.7	11.1

TABLE II — C.

PERCENTAGE OF CLASS A AND CLASS B, AND OF EIGHT HUNDRED AND ONE NON-COLLEGE RELATIVES AND FRIENDS OF BOTH CLASSES MARRIED AT SPECIFIED AGES.

Age at Marriage.	Per cent Married at Specified Ages. Of Class A.	Of Class B.	Of Non-College Friends and Relatives of Class A.	Of Non-College Friends and Relatives of Class B.
17–21	....	8.00	17.64	13.55
21	0.30	13.40	25.69	24.28
22	8.00	21.00	35.98	38.68
23	19.10	29.70	46.94	51.67
24	31.20	42.00	57.67	61.83
25	45.40	55.80	67.96	75.11
26	58.30	63.20	73.77	80.76
27	67.80	69.40	80.48	85.36
28	74.00	76.10	84.28	88.75
29	81.10	84.50	86.06	92 70
30	87.50	87.20	90.98	95.24
31	90.00	91.00	92.54	95.52
32	91.20	92.20	94.77	95.80
33	94.30	94.50	95.44	96.37
34	95.80	95.50	95.88	96.37
35	97.30	96.90	97.22	98.34
36	98.00	97.20	97.66	98.62
37+	100.00	100.00	100.00	100.00

friends of Class A married earlier than either Class A or Class B, and that the non-college friends and relatives of Class B married earliest of all, *viz.*: —

50 per cent of Class A married between . . . . . 25 and 26 years of age.
" " " " " B " " . . . . . 24 " 25 " " "
" " " " " A's friends and relatives married between 23 " 24 " " "
" " " " " B's " " " " " 22 " 23 " " "

The lines drawn across the columns at 75 per cent and 90 per cent, respectively, show the same peculiarity. The effect of the kind and degree of education in delaying the marriage of both college and non-college is strikingly apparent.

TABLE II — D.

AVERAGE AGE AT MARRIAGE OF CLASS A AND CLASS B BY NUMBER OF YEARS MARRIED.

	Married 10 Years or Less.		Married from 10 to 20 Years.		Married 21 Years and Over.	
	A.	B.	A.	B.	A.	B.
Average age at marriage..	26.8	25.9	26.1	24.2	24.2	21.6

Table II — D also shows that the age of marriage for both classes has been getting later and later; those that were married at the earlier ages — for the most part — are those who have been longest married. This would be inevitable as the entrance requirements of colleges have been gradually growing more severe during the past 30 years, thus postponing the age of admission and graduation, and presumably of marriage for Class A, as well as prolonging the period spent by Class B in public and private schools. In England in 1891 the average age of spinsters marrying was 24.8, and of spinsters of the professional and independent classes, 26.4. In Massachusetts for the twenty-year period, 1875–95, the average age of spinsters marrying was 25.4. The marriage of educated women is seen by comparison not to have been postponed so much beyond that of the average population as might have been expected.

Table III — A and B shows the number of living children of both classes by age and sex. Class A has an average of 55 per cent male children and 45 per cent female; Class B as a whole averages 47.7 per cent male and 52.3 per cent female; the curious variation of the sisters' (46 per cent male) and the cousins' children (43.6 per cent male), on the one hand, and the friends' (53.6 per cent male), on the other, is unaccountable, except on the supposition that the basis of numbers is too small. This is scarcely adequate, however, to account for the wide difference between the children of Class

TABLE III—A AND B.

LIVING CHILDREN OF BOTH CLASSES BY AGE AND SEX.

Age of Children in Years.	Of 343 College Mothers.			Of 313 Non-College Mothers.						
				Sisters.		Cousins.		Friends.		Total.
	M.	F.	Total.	M.	F.	M.	F.	M.	F.	
Under 1	26	17	43	3	1	3	3	11	8	29
1	24	20	44	2	4	1	3	11	13	34
2	25	19	44	4	3	2	3	9	11	32
3	22	10	32	5	9	..	..	10	9	33
4	20	17	37	3	4	1	2	16	9	35
5	13	20	33	7	7	2	2	9	10	37
6	29	21	50	3	6	..	7	10	12	38
7	14	10	24	5	8	2	2	14	10	41
8	16	20	36	4	4	4	1	14	7	34
9	14	8	22	1	3	3	..	11	8	26
10	15	9	24	3	1	1	6	4	5	20
11	20	11	31	3	5	1	1	4	4	18
12	8	9	17	2	2	2	..	6	5	17
13	10	8	18	1	2	2	..	..	3	8
14	7	7	14	3	2	1	1	6	7	20
15	4	9	13	1	2	2	2	2	2	11
16	5	6	11	3	3	1	3	6	4	20
17	5	1	6	3	1	..	1	1	2	8
18	6	5	11	1	2	..	1	5	3	12
19	1	2	3	4	4	1	..	2	4	15
20	2	3	5	2	3	..	..	4	..	9
21	2	2	4	2	2	1	1	3	1	10
22	..	2	2	2	..	..	..	1	1	4
23	1	4	5	1	3	..	..	..	1	5
24	..	..	..	1	..	..	..	3	..	4
25	1	2	3	..	..	1	..	1	..	2
26	..	..	..	1	..	..	..	4	2	7
27	3	..	3	..	2	..	..	..	1	3
28	1	2	3	..	1	..	..	1	3	5
29	1	..	1	1	1	..	..	1	..	3
30	3	1	4	..	..	..	..	2	1	3
31	..	..	..	1	..	..	..	..	..	1
32	..	2	2	..	..	..	..	..	2	2
33	..	1	1	..	..	..	..	..	..	..
34	1	..	1	..	..	..	..	..	..	..
35	..	..	..	..	..	..	..	..	..	..
36	1	..	1	..	..	..	..	..	..	..
37	..	..	..	..	..	..	..	..	..	..
38	1	1	2	..	..	..	..	..	..	..
39	1	..	1	..	..	..	..	..	..	..
Age unknown	10	5	15	3	3	..	1	15	13	35
Age and sex unknown	..	..	..	..	..	..	..	..	..	3
Total number	312	254	566	75	88	31	40	186	161	584
Total per cent	55	45	..	46	54	43.6	56.4	53.6	46.4	..

A (55 per cent male) and of Class B (47.7 per cent male). In an average population the proportion of children born is 52 per cent male to 48 per cent female. The basis of numbers is undoubtedly too small to warrant any discussion of the bearing of these facts upon the current theories of sex.

TABLE IV—A AND B.

NUMBER OF LIVING CHILDREN PER YEARS OF MARRIED LIFE IN BOTH CLASSES.

Age at Marriage.	Total Number of Years of Married Life.		Number of Living Children.		Number of Years of Married Life to Each Child.	
	A.	B.	A.	B.	A.	B.
17.....	....	25.0	..	3	....	8.33
18.....	...	158.0	..	17	....	9.30
19.....	...	294.8	..	44	....	6.70
20.....	47.3	373.0	7	53	6.76	7.03
21.....	86.5	379.6	16	42	5.40	9.03
22.....	214.6	356.0	35	60	6.13	5.93
23.....	441.5	414.9	69	87	6.40	4.76
24.....	517.2	413.6	78	77	6.63	5.37
25.....	520.2	282.9	88	49	5.91	5.77
26.....	334.0	222.7	81	40	4.12	5.56
27.....	265.3	247.2	52	28	5.10	8.82
28.. ...	167.2	207.9	34	28	4.91	7.42
29.....	189.9	52.9	16	9	11.93	5.84
30.....	167.9	87.2	31	16	5.42	5.45
31.....	74.2	29.0	10	6	7.42	4.83
32.....	48.5	51.2	9	12	5.40	4.28
33.....	109.5	42.0	14	5	7.82	8.40
34.....	25.6	22.2	6	6	4.26	3.70
35.....	45.2	21.0	3	..	15.08	....
36.....	2.5	....	..	..	....	....
37.....	8.7	10.5	..	..	....	....
38.....	6.5	....	..	..	....	....
39.....	9.0	3.0	..	..	....	....
40.....	....	....	..	..	....	....
41.....	1.0	....	..	..	....	....
42.....	....	1.5	..	..	....	....
43.....	....	.. .	..	..	...	....
44.....	....	2.0	..	..	....	....
45.....	....	....	..	..	....	...
46.....	....	2.5	..	..	....	....
47.....	....	....	..	..	....	....
48.....	....	....	..	..	....	....
49.....	....	1.8	..	..	....	....
Total...	3282.3	3702.4	549	582	5.97	6.71

In Table IV—A and B the apparent gain to the population through the earlier marriage of Class B is very striking. Class B beginning to marry at the age of 17 has 477 years of married life and 64 more children than Class A who begin to marry at 20. No woman of either class who married after the age of 35 has any living children. Consequently the child-bearing period lies between 17 and 35 years for Class B and between 20 and 35 for Class A. Dividing the total years of married life of each class by the number of living children of each class, respectively, it appears that Class A bore one child to every 5.97 years of married life, while Class B bore one child to 6.71 years of married life. If the 477 years of married life and the 64 children be subtracted from the totals of Class B the number of years of married life to each child varies only a quarter of a per cent, *i. e.*, 5.97 for Class A, 6.22 for Class B. Thus it appears that the college women bore more children per years of married life than the non-college women in spite of the earlier marriage of Class B.

Having ascertained the average number of years of married life to each child in both classes with certain antecedent data, the next step is to discover the number of children per woman. Table V—A and B gives this fact in conjunction with several others. Class A has borne on the average 1.65 children in 9.6 years of married life; while Class B has borne 1.875 children in 11.6 years of married life. This corroborates the results of the only English* statistics which are comparable. Mrs. Sidgwick gives 1.53 as the number of children per marriage of English women students in 1890 and 1.81 as that of their sisters. Absolutely Class B has borne a slightly larger number of children per marriage than Class A; but in proportion to the number of years of married life Class A has borne 9 per cent more children than Class B. In both English and American statistics the number of children born to *each year of marriage* is slightly larger for the

* Sidgwick, Mrs. Henry: *Health Statistics of Women Students of Cambridge and Oxford and of their Sisters.* Cambridge: University Press, 1890.

TABLE V—A AND B.

AVERAGE NUMBER OF LIVING CHILDREN TO EACH WOMAN BY AGE AT MARRIAGE AND NUMBER OF YEARS MARRIED.

Age at Marriage.	Percentage of Women Marrying at Each Age.		Average Number of Years Married to Each Marriage.		Average Number of Living Children to Each Woman.	
	Class A.	Class B.	Class A.	Class B.	A.	B.
17.....	....	.31 +	....	25.00	...	3.00
18.....	....	2.19 +	....	22.57	....	2.42
19.....	....	5.32 +	....	17.34	....	2.58
20.....	.59 +	5.95 +	23.66	19.63	3.50	2.78
21.....	2.66 +	7.52	9.61	15.81	1.77	1.75
22.....	5.32 +	8.77	11.92	12.71	1.94	2.14
23.....	10.66 +	12.22 +	12.26	10.63	1.91	2.23
24.....	12.13 +	11.91 +	12.61	10.88	1.90	2.02
25.....	14.20 +	9.40 +	10.83	9.42	1.83	1.63
26.....	13.02 +	6.27 +	7.60	11.13	1.84	2.00
27.....	9.47 +	6.58 +	8.29	11.77	1.62	1.38
28.....	6.21 +	8.46 +	7.96	7.70	1.61	1.03
29.....	7.10 +	2.82 +	7.91	5.84	.66	1.00
30.....	6.51 +	3.76 +	7.62	7.27	1.40	1.33
31.....	2.36 +	1.25 +	9.28	7.25	1.25	1.50
32.....	1.48 +	2.19 +	9.70	7.32	1.80	1.71
33.....	2.96 +	.94	10.95	14.00	1.40	1.66
34.....	1.48 +	1.25 +	5.11	5.56	1.20	1.50
35.....	1.48 +	.62 +	9.05	10.50	.60	....
36.....	.59 +	....	1.25	....	....	....
37.....	.59 +	.62 +	4.37	5.25	....	....
38.....	.29	....	6.50	....	....	....
39.....	.29	.31 +	9.00	3.00	....	....
40.....	....	....	....	....	....	....
41.....	.29 +	....	1.00	....	....	....
42.....	....	.31 +	....	1.50	....	....
43.. ..	....	....	....	....	....	....
44.....	....	.31 +	....	2.00	....	....
45.....	....	....	....	....	....	....
46.....	....	.31 +	....	2.50	....	....
47.....	....	....	....	....	....	....
48.....	....	...	....	....	...	....
49.....	....	.31	....	1.08	....	....
Totals..	100.00	100.00	9.60	11.60	1.65	1.875

college women than for the non-college women; in both cases, also, the number of *children per woman* is slightly less for the college than for the non-college women. The 107 Ameri-

can women who took advanced degrees and honors have borne 1.61 children on the average, although the age of marriage of those who took the Ph.D. is somewhat higher than the average.

TABLE VI—A AND B.

NUMBER OF CHILDLESS WOMEN IN RELATION TO THE YEARS OF MARRIED LIFE.

Number of Years Married.	Number of Childless Women. Class A.	Number of Childless Women. Class B.	Total.
Less than 1.....	11	3	14
1.....	10	5	15
2.....	10	7	16
3.....	6	4	11
4.....	6	6	12
5.....	5	1	6
6.....	10	5	15
7.....	5	..	5
8.....	6	1	7
9.....	1	3	4
10.....	1	1	2
11.....	3	3	6
12.....	..	2	2
13.....	..	2	2
14.....	2	3	5
15.....	2	1	3
16.....	1	..	1
17.....	2	..	2
18.....	2	1	3
19.....	..	2	2
20.....	1	..	1
21.....	..	1	1
22.....	..	..	..
23.....	..	..	..
24.....	1	..	1
25.....	..	2	2
26.....	..	1	1
27.....	..	..	..
28.....	1	..	1
29.....	..	..	..
30.....	1	2	3
Total.....	87	56	143
Per cent childless..	25.36	17.89	21.79

In Table VI—A and B 25.4 per cent of Class A and 17.9 per cent of Class B are childless; but it appears that 21 women of Class A as against 8 women of Class B have been

married less than 2 years. If all who have been married less than 2 years be subtracted from the table, then 19.2 per cent of Class A and 15.3 per cent of Class B were childless. If the 87 childless women be subtracted from the total of Class A and the 56 childless women from the total of Class B, the child-bearing members of Class A have borne 2.21 children per woman, and the child-bearing members of Class B 2.28 children per woman. It appears also that the mothers belonging to Class A have borne one child to every 4.82 years of marriage, while the mothers in Class B have borne one child to every 5.51 years of marriage. If it be taken into account that Class A has been married on the average

TABLE VII—A AND B.

DEAD CHILDREN OF CLASSES A AND B.

Age of Mothers at Marriage.	Of Class A.				Of Class B.			
	Miscarriages.	Still Births.	Under 1 Year.	1 Year and Over.	Miscarriages.	Still Births.	Under 1 Year.	1 Year and Over.
17	..	..	..	..	....	....	..	1
18	..	..	..	..	....	....	..	..
19	..	..	..	..	....	...	1	6
20	..	..	2	..	...	....	4	5
21	..	..	4	..	....	....	5	..
22	..	..	6	2	....	....	4	1
23	..	..	5	7	....	....	9	4
24	..	..	6	3	...	....	5	3
25	..	..	5	2	....	....	4	1
26	..	..	7	1	....	....	3	1
27	..	..	2	2	....	....	4	4
28	..	..	4	1	....	....	5	4
29	..	..	2	2	....	....	..	..
30	..	..	4	1	....	....	1	1
31	..	..	1	1	....	....	..	..
32	..	..	..	1	....	....	..	..
33	..	..	2	..	....	....	1	1
34	..	..	..	1	....	....	..	..
35 and over	..	..	..	..	....	....	..	..
Total dead	108	9	50	24	89	14	45	33

2 years less than Class B, it may be concluded that when the child-bearing period of both classes shall have passed, Class A will not only have borne more children per years of married life, but will probably have borne as many — possibly more children per woman than Class B.

Table VII—A and B. Miscarriages as well as still-births have been included in this table. It is exceedingly doubtful, however, whether the figures have any value. Women hesitate to confess such misfortunes, and the internal evidence of the blanks shows that Class B was more reluctant to fill out this portion of the schedules than Class A. Including miscarriages, Class A lost 25.2 per cent of all conceptions, while Class B lost only 23.6 per cent. If the miscarriages be omitted from both classes, Class A lost 12.8 per cent, and Class B 13.6 per cent. If, again, both miscarriages and still-births be omitted, it appears that Class A lost 11.5 children after birth, and Class B 11.6 per cent. The basis of numbers is too small to draw conclusions, but the result is of negative significance as showing that there is no marked difference between the two classes in respect to mortality of children.

TABLE VIII.

HEALTH OF CHILDREN OF CLASS A AND CLASS B.

Health.	Children of Class A.	Children of Class B.	Totals.	
			Per cent A.	Per cent B.
Delicate	21	27	3.7	4.6
Moderately well	250	278	44.2	47.4
Robust	295	282	52.1	48.0
Totals	566	587	100.0	100.0

Table VIII — A and B shows no striking difference in the health of the children of the two classes; 96.3 per cent of A children, and 95.4 per cent of B children have satisfactory health. The slight difference there is, however, is in favor of Class A.

TABLE IX—A AND B.

HEALTH OF BOTH CLASSES AFTER MARRIAGE BY NUMBER OF CHILDREN BORNE.

Number of Children Borne.	Health Improved After Marriage.								Health the Same as Before Marriage.		Health Declined After Marriage.							
	Number Whose Health Improved						Total Number of Points Improved.				Number Whose Health Declined						Total Number of Points Declined.	
	1 Point.		2 Points.		3 Points.						1 Point.		2 Points.		3 Points.			
	A.	B.	A.	B.	A.	B.	A.	B.	A.	B.	A.	B.	A.	B.	A.	B.	A.	B.
1	19	13	4	4	..	..	27	21	50	44	11	8	1	1	1	..	16	10
2	18	15	3	1	..	..	24	17	46	49	6	10	2	3	2	..	16	16
3	4	13	3	2	..	1	10	20	30	26	8	4	1	5	.	..	10	14
4	4	7	1	3	..	..	6	13	13	18	5	8	..	..	..	..	5	8
5	3	1	..	2	..	..	3	5	11	5	2	3	..	1	..	..	2	5
6	3	1	..	..	..	..	3	1	4	6	2	1	..	..	..	..	2	1
7	..	..	..	..	..	..	..	..	1	2	..	2	..	..	..	..	..	2
8	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..
Total number	51	50	11	12	..	1	73	77	157	152	34	36	4	10	3	..	51	56
Total per cent	..	..	..	..	..	..	..	..	60.4	58.2	..	..	..	..	..	..	..	..

Table IX — A and B compares the health of the two classes before and after marriage; the schedules exhibit four grades of health,— delicate, fair, moderately well, robust; in tabulation an improvement or decline of one grade was registered as one point. In the case of Class A the health of 23.9 per cent improved, 15.7 per cent declined, and 60.4 per cent remained the same. Of Class B 24.1 per cent improved, 17.6 per cent declined, and 58.2 per cent remained the same. The difference in the method of education has evidently made no marked difference in the health of either class after marriage. The conclusion arrived at is again chiefly negative, there being only a slight difference in favor of Class A.

TABLE X-A AND B.

OCCUPATIONS BEFORE MARRIAGE OF 343 A AND 313 B WOMEN.

Occupations of Both Classes.	Number of A.	Number of B.	Average Number Years Spent in each Occupation. A	Average Number Years Spent in each Occupation. B	Per cent of Total Number in each Occupation. A	Per cent of Total Number in each Occupation. B
Teaching	190	70	4.28	4.86	55.4	22.4
Home or domestic	39	61	2.91	3.92	11.4	19.5
Clerical	9	12	3.29	3.65	2.6	3.8
Studied or married upon graduation	32	12	3.50	2.00	9.3	3.8
Journalism	4	....	6.50	....	1.2	....
Professional	5	1	5.20	3.00	1.4	.31
Philanthropic	5	....	5.60	....	1.4	....
China painting and art embroidery	2	....	2.00	....	.6	....
Music study	....	5	....	7.50	....	1.6
Singer	....	2	....	6.50	....	.63
Artist	....	2	....	12.00	....	.63
Working girl (saleswoman, typewriter, factory)	....	5	....	7.00	....	1.59
Dressmaker and milliner	....	2	....	5.50	....	.63
Matron in State institution	....	1	....	3.00	....	.31
No occupation	25	74	3.00	....	7.3	23.60
None stated	32	66	....	....	9.3	21.10
Totals	343	313	4.15	4.88	100.0	100.00

Table X — A and B shows that 55 per cent of the college women had been teaching 4.28 years each before marriage, while only 22.4 of the non-college women had been teaching 4.88 years each. Of Class A 11.4 per cent, as compared with 19.5 per cent of Class B, remained at home until marriage; 16.6 per cent of Class A, as compared with 44.7 per cent of Class B, either had no definite occupation before marriage or stated none.

More than one-half of the college women were engaged in teaching, and nearly three-fourths in some occupation outside of their own homes before marriage. Less than one-fourth of the non-college women were engaged in teaching, and only slightly more than one-third were engaged in some occupation outside their own homes before marriage. Evidently collegiate education for women results in wage earning; it may be that the girls who go to college are a selected class of greater initiative, or with the purpose of wage earning already formed, or it may be that this kind of education develops a desire to work; whatever the cause, the result is a striking degree of economic independence before marriage.

In Table XI — A and B it is apparent that 77 per cent of the college women married college or university men, that is, men as well educated as themselves; it implies also that 23 per cent of them married men whose education was nominally, at least, inferior to their own. On the other hand, 51 per cent of the non-college women married men whose education was technically, at least, superior to their own. This marked difference is further emphasized by the occupations of the husbands; 65 per cent of the husbands of Class A are professional men,— 57 per cent, indeed, are teachers, lawyers, physicians, scientists, or clergymen; while only 37 per cent of Class B married men of this class, and the remaining 63 per cent married men in business life. Apparently women and men of higher mental training demand intellectual companionship in marriage, while women of less severe and ex-

tended training find companionship in men of tastes not obviously literary or scientific.

TABLE XI-A AND B.

EDUCATION AND OCCUPATIONS OF THE HUSBANDS OF CLASS A AND CLASS B.

• Education of Husbands of	A	B	Occupation of Husbands of	A	B
College or university	226	161	Teacher	80	37
West Point and Annapolis	3	3	Lawyer	54	35
Normal school	1	2	Physician	31	27
Public school	11	38	Scientist (investigator, botanist, chemist, astronomer, metallurgist)	7	2
High school	30	34	Clergyman	24	15
Academy	7	16	Artist	3	1
Private school	4	12	Engineer	10	12
Business college	6	5	Architect	2	2
Business life	1	3	Journalist	11	9
Shop	1	2	Dentist	1	3
Self-educated	2	3	Veterinarian	1	..
No education	....	3	Army and navy	3	3
None stated	11	31	Business	25	30
			Merchant	28	34
			Importer	2	..
			Banker	13	10
			Manufacturer	12	18
			In trade	..	10
			Broker	4	3
			Railroading	4	1
			Superintendent	5	7
			Druggist	1	2
			Hotel keeper	..	1
			Clerks and salesmen	9	29
			Agriculturist	1	17
			Philanthropist	1	..
			Retired	3	1
			None stated	8	4
	343	313		343	313

• The husbands are not necessarily graduates but have attended the institutions named for a longer or shorter period.

Table XII — A. In this table we see that the graduates of women's colleges married 15 per cent less college men than the coeducated women; *i. e.*, the graduates of women's col-

leges have married a larger proportion of business men. Subdividing the 246 college-bred husbands into two classes, *i. e.*, those who graduated from men's colleges, and those who were coeducated, we find that 84 per cent of the separately educated men married women's-college graduates, while 75 per cent of the coeducated men married coeducated women. It

TABLE XII-A.

EDUCATION OF 332 HUSBANDS OF COEDUCATED AND WOMEN'S COLLEGE GRADUATES (CLASS A).

Education of Husbands.*	Number of Wives Graduated from		Percentage of Wives Graduated from	
	Coeducational Colleges.	Women's Colleges.	Coeducational Colleges.	Women's Colleges.
College bred	124	122	82.7	64.0
Non-college	22	54	14.7	29.7
Education not stated	4	6	2.6	3.3
Totals	150	182	100.0	100.0

* Husbands of women graduated from annexed or affiliated colleges are omitted.

further appears that 90 per cent of the men who married coeducated women graduated at the *same* institution as their wives, and only 10 per cent from others. Although on the average 4.93 years elapsed between graduation and marriage, the acquaintance made in college seems to have determined the marriage of a large proportion of the coeducated women. Whether on this account the coeducated women have a better chance of marriage than the graduates of women's colleges, is an interesting point upon which we have no data.

In the first two columns of Table XIII — A and B it appears that Class B has 12 per cent more women among those having the lowest income, and 10 per cent less among those having the highest income, than Class A. This is surprising when taken in connection with the fact that Class B, as shown by the occupation table (XI—A and B), is dis-

TABLE XIII. HEALTH AND INCOME OF CLASSES A AND B.

Joint Annual Income of Family.	Class A.		Class B.		Delicate Before Marriage.			
					A		B	
	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.
Less than $2000	84	24.5	115	36.7	6	40.0	12	70.6
From $2000 to $5000	160	46.6	138	44.1	5	33.4	5	29.4
Over $5000	93	27.1	53	16.9	4	26.6	....	....
Not given	6	1.8	7	2.3	..	...	...	....
Totals	343	100.0	313	100.0	15	100.0	17	100.0

Joint Annual Income of Family.	Wives whose Health has Declined.				Delicate Children.				Per cent Having Specified Incomes.	
	A		B		A		B			
	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Graduates of Coeducational Colleges.	Graduates of Women's Colleges.
Less than $2000	11	26.8	25	50	6	35.3	8	80	32.6	15.9
From $2000 to $5000	12	29.2	16	32	7	41.2	2	20	46.0	48.4
Over $5000	18	43.9	9	18	4	23.5	..	..	18.0	34.6
Not given	....	....	....	....	....	....	..	..	3.4	1.1
Totals	41	100.0	50	100	17	100.0	10	100	100.0	100.0

tinctly less independent and more domestic than Class A. It is a matter of current opinion that the "average" man is more attracted by the non-college woman, that is, the woman of distinctly domestic tastes and accomplishments. The "average" man is generally engaged in business, and his chance of securing an income above $5000 is likely to be far greater than that of the professional man. It was therefore to have been expected that the non-college women would have the larger average income.

The standard of living of educated persons is very exacting in certain particulars, as, for instance, in the great amount of household service required, the more exquisite care of children, and the greater amount spent for their education. An income of less than $2000 per year for such persons means either partial service or none at all, and excessive economy in order to meet this standard. This throws a greater strain on the housewife. Of the two classes under observation, Class A has apparently borne this strain better than Class B, for Class B contains relatively a larger percentage of delicate wives and children among those whose income is less than $2000. It may be surmised either that the college women have better health or that they economize their strength more wisely and live more simply.

The last two columns of the table bring out a curious contrast in income between the graduates of coeducational and of women's colleges. Nearly one-third of the coeducated women have incomes below $2000, while a little more than one-third of the graduates of women's colleges have incomes above $5000. It has already been noted in Table XII that the graduates of women's colleges married a larger proportion of business men, and the coeducated women a larger proportion of professional men. It is evident, therefore, that the higher average incomes of the women's college graduates is due to the fact that their husbands are largely engaged in business. The lower average income of the coeducated

women is, on the other hand, attributable to the fact of their having married a larger proportion of salaried professional men. From the strictly financial point of view, the graduates of women's colleges have married best, the coeducated women next, and the non-college women least successfully.

Conclusions.

In the absence of all statistics of classes in the population of the United States by education, the college man and woman have commonly been compared with the average person of the state or federal census. Such comparison is obviously unjust. The attempt to eliminate for women every considerable factor of difference except education narrows the inquiry to two small selected classes, — married college women and their relatives and friends who have been educated in other ways. No inferences have been drawn, therefore, which have not seemed wholly warranted by a marked difference between the two classes. The most striking result has been a negative one, *viz.*, that there is by no means the degree of difference between the two classes, in matters of health, marriage, and child-bearing capacity that has been looked for both by the friends and the enemies of the collegiate education of women. A summary of the conclusions reached in the previous pages will show this more clearly.

1. The marriage of college women was postponed two years as compared with that of the non-college women (26.3 *vs.* 24.3 years).

2. The age of marriage for both classes has been growing later in the last 30 years but varies only slightly from that of England (26.4), and Massachusetts (25.4).

3. The college women have a high percentage of male children (55) as compared with non-college women (47.7).

4. The non-college women have been married an average of two years longer than the college women, and have borne a slightly larger number of children; but the college women

have borne the larger number of children per years of married life.

5. There is practically no difference between the two classes in respect to misfortunes attendant upon pregnacy or mortality of children.

6. The health of the children of both classes is about equally satisfactory, the percentage of delicate children being slightly less and of robust children slightly more in the case of college mothers.

7. There is no marked difference between the classes in respect to health before or after marriage.

8. Before marriage more than one-half the college women were engaged in teaching and nearly three-fourths in some occupation outside their own homes; less than one-fourth the non-college women were teaching and only slightly more than one-third were engaged in occupations outside their own homes. Obviously college training leads to a high degree of economic independence.

9. Three-fourths of the college women married college men, while only one-half of the non-college women married college men.

10. Sixty-five per cent of the college women, as compared with 37 per cent of non-college women, married professional men; 63 per cent of the non-college women married business men.

11. From the financial standpoint the college women married better than the non-college.

Thus it appears that the college women, although marrying two years later than their sisters, cousins, and friends, have borne a slightly larger number of children per years of married life, and that there is practically no difference between them as regards the mortality of children, health before and after marriage, or accidents of pregnacy. These conclusions are nearly identical with those reached by Mrs. Sidgwick ten years ago concerning the English college women, as compared

with their non-college sisters. The most striking contrast between the two classes appears in the marked tendency of college women to earn their own living before marriage, to marry college-educated and professional men, and in the fact of their higher average income. Some of the most interesting minor results are the differences between the coeducated women and the graduates of women's colleges. Coeducated women married a larger proportion of college men and of coeducated men, while the graduates of women's colleges largely married men who were educated in men's colleges. The generally accepted opinion that coeducational colleges promote marriage is seen to have good foundation, while the supposed prejudice of separately educated men against coeducated women is illustrated as well. That the women's college graduates should have a higher average income than the coeducated women would follow from the difference in their husbands' occupations, but that the college women as a class should have married better financially than the non-college, was scarcely to have been anticipated.

Certain other interesting facts which cannot be tabulated statistically are revealed by the answers to the schedules. The questions in regard to health of mothers and children bring out prominently the fact that marriage develops a sense of responsibility. Almost without exception the women speak of taking better care of themselves after marriage. There are several pronounced cases where teaching is responsible for the loss of health before and after marriage. The reasons for improvement in health after marriage are most interesting. The college women particularly speak enthusiastically; such phrases as: domestic life less wearing, happiness in companionship and sympathy, contentment, congeniality, freedom from strain, less worry, more active life, better nourishment, greater regularity, child bearing, greater care of health — recur again and again in their replies. Apparently the college women, having been out in the world

to earn their own living, appreciate the happiness, serenity, and protection of home life. Class A, too, have much more to say about hygienic living after marriage in contrast to nervous strain and bad conditions of teaching especially before marriage.

The reasons for decline in health are not given very fully, and may be condensed under such general heads as "overwork before marriage," "carelessness of health," "anxiety and strain after marriage," "overwork during pregnancy," "child bearing," "ignorance."

The tenor of the replies would indicate that the college women have a greater sense of responsibility in marriage and motherhood; that they lay more emphasis on hygienic knowledge; and that they are personally more contented with the conditions of their married life. Since the non-college women filled out their blanks somewhat less fully, too much emphasis should not be placed on this contrast, but the contrast is unmistakable.

So far as these statistics show, the type of education is less responsible for the success or failure of women in domestic life than the subject matter of that education and the conditions under which it is pursued. The college-trained woman has apparently held her own in domestic life, as compared with women of her own class, in spite of the strain of college routine and the generally unhygienic conditions of living which formerly prevailed in colleges open to women.

THE COMPARATIVE ACCURACY OF DIFFERENT FORMS OF QUINQUENNIAL AGE GROUPS.

By Allyn A. Young.

The United States census reports the ages of the persons enumerated by single years. Over one hundred age classes are thus differentiated. It is, of course, impracticable to combine so detailed a classification with the results of more than a few other census inquiries. In the majority of cases in which the census differentiates economic or social classes by age, recourse must be had to age groups. As the importance of age statistics is due in large part to the added value which they give to other results of the census, the form of groups used deserves careful consideration.

From the standpoint of accuracy a classification by groups is preferable to one by single years. Because of the excessive concentration of reported ages on the years which are multiples of 5, a quinquennial grouping is especially accurate.

The numerical accuracy of an age group depends upon the ratio between the number of reported ages which it includes and the number of persons enumerated whose true ages would be included within the same group. If the field of attraction of each age at which concentration occurs does not extend beyond the limits of one age group, the degree of concentration will not affect the accuracy of the age groups. The most accurate form of age group, then, is one which will include with each year of concentration the years from which this concentration is chiefly drawn. The choice of an age group should be influenced by the manner in which concentration takes place. Is it then the prevailing tendency simply to return one's age at the nearest year of concentration? Is there a special tendency to return ages at less than the truth? If there is such a tendency, is it strong enough to affect the comparative accuracy of different

forms of age groups? It is evident that we must be able to answer these questions definitely before we can have a basis for judging the accuracy of a method of age grouping.

If quinquennial groups are used, a method that naturally suggests itself is to place the five lowest ages of the table in the first group, the next five ages in the second group, and so to the end of the table. This method is used by the United States census. There is no reason to believe that its adoption was influenced by any special reasons beyond those of convenience. Criticisms that have been made on this form of grouping have been based on the fact that each group begins with a multiple of 5, that is, with a year of concentration. Mr. George K. Holmes has made the following criticism: —*

> It seems generally to be agreed by those who have given the distribution of ages as reported by the enumerators any consideration for the purpose of tabulating them, that such a grouping as this should not be repeated. The years which are notoriously erroneous, that is, the quinquennial and decennial years, are placed at one end in each classification.
>
> . . . . . .
>
> I would suggest that a quinquennial grouping should be continued, under a new arrangement, the first group to contain ages under three, the next group to be 3 to 7 years, 8 to 12, 13 to 17, and so forth. This would place the especially erroneous years in the middle of the groups in each case.

Mr. Holmes does not state why it is preferable to place the "especially erroneous years in the middle" rather than at the end of the groups. But it is evident that his criticism rests upon the assumption that the prevailing tendency is to return ages at the nearest year of concentration; that is, that approximately as many persons are returned as older than the truth as are returned as younger than the truth, or, in other words, that over statement of age and under statement of age are about equally common.†

* *The Federal Census*, Publications of the American Economic Association, New Series, No. 2, pp. 57, 58.

† As a matter of fact, if all wrongly reported ages were returned at the nearest year of concentration, the number returned as greater than the truth would be slightly larger than the number returned as less than the truth.

It is possible to test this hypothesis and thus to arrive at definite conclusions concerniug the accuracy of different forms of quinquennial age groups. We have as a starting point the fact that concentration is greater on years which are multiples of 10 than on years which are multiples of 5 and not of 10. The greater the concentration the greater, of course, will be the depletion in the years from which the concentration is drawn. The depletion resulting from concentration on the even multiples of 5 will be greater than that resulting from concentration on the odd multiples of 5. Now, as already stated, the most accurate form of quinquennial age group is one which includes with each year of concentration the years from which the concentration is mainly drawn. If, however, the system of grouping is such that each group excludes some of the years of depletion which have contributed mainly to the year of concentration in that group, and includes some of the years of depletion that have contributed to the year of concentration in the next group, the effect will be to enlarge the groups containing the multiples of 10 at the expense of the other groups. In other words, if the quinquennial groups are so formed that the fields of attraction of the years of concentration extend beyond the limits of the several groups, a year which is a multiple of 10 would draw relatively more from the neighboring groups than would a year which is an odd multiple of 5. This would result in making the groups alternately too large and too small. The excess of the number of reported ages in groups containing years that are even multiples of 5 over the number reported in groups containing years which are odd multiples of 5 is a measure of the comparative inaccuracy of a system of age grouping. This point may be brought out more clearly by an illustration.

If Mr. Holmes' hypothesis that the erroneously reported years are drawn equally from above and below the year of concentration is correct, an age group containing the years 43–47 should be more accurate than the group 45–49,

although both groups contain the year of concentration 45. The years 48 and 49 would have been drawn upon to make up the large concentration of the year 50, and would therefore be depleted to a greater extent than would the years 43 and 44. The group 43–47 would therefore (on Mr. Holmes' hypothesis) be *relatively** larger than the group 45–49. In this case also the group 48–52 would be *relatively* smaller than the group 50–54.† Evidently the excess of the concentration on the multiple of 10 over that on the odd multiple of 5 has less effect on the relative sizes of the groups which we have assumed to be the more accurate than on the other form of groups. The principle thus illustrated may be expressed as follows:—

Of two series of quinquennial age groups, the more accurate will be the one in which the alternate excess and deficiency in the size of the successive groups is less marked.

To apply this principle to the census age returns, we may represent the relative size of each age group by the expression $\frac{G_x}{G_{x-1} + G_{x+1}}$.‡ Here G_x represents the number enumer-

* By the *relative* inequality of age groups is here meant an inequality distinct from the natural inequality caused by the fact that as age increases population decreases.

† This illustration may be presented more clearly by the use of mathematical symbols. In the following equations the signs of inequality are used as referring to *relative* and not to absolute inequality:—

Let P_x = number reported at any age x.

Let G_5 = number reported in group containing multiple of 5.

Let G_{10} = number reported in group containing multiple of 10.

If $G_5 = P_{43} + P_{44} + (P_{45} + P_{46} + P_{47})$

and $G'_5 = (P_{45} + P_{46} + P_{47}) + P_{48} + P_{49}$,

$G_5 - G'_5 = (P_{43} + P_{44}) - (P_{48} + P_{49})$

Since $(P_{43} + P_{44}) > (P_{48} + P_{49})$, $G_5 > G'_5$. (A)

Similarly, if

$G_{10} = P_{48} + P_{49} + (P_{50} + P_{51} + P_{52})$

and $G'_{10} = (P_{50} + P_{51} + P_{52}) + P_{53} + P_{54}$

Since $(P_{48} + P_{49}) < (P_{53} + P_{54})$, $G_{10} < G'_{10}$. (B)

From (A) and (B) we conclude that

$(G_{10} - G_5) < (G'_{10} - G'_5)$.

‡ This expression represents the numerical relation of each age group to the sum of the two neighboring groups. For our purposes such an expression is much preferable to one which represents the numerical size of an age group in its relation to the entire number of ages reported.

ated in any age group x. The following table illustrates the application of this expression and also shows the true relations between various age groups in a normal stationary population. For convenience the results are expressed in percentages: —

TABLE SHOWING PROPORTION OF NUMBER IN EACH AGE GROUP TO THE SUM OF THE NUMBERS IN THE TWO NEIGHBORING GROUPS. BASED ON FARR'S LIFE TABLE NO. 3, l_x COLUMN.

Age Group.	G_x	$G_{x-1} + G_{x+1}$	$\frac{G_x}{G_{x-1} + G_{x+1}}$ Expressed as a Per Cent.
0-4	4,166,056	.. ...	....
5-9	3,602,611	7,641,334	47.1
10-14	3,475,278	7,185,525	48.4
15-19	3,382,914	6,732,376	50.2
20-24	3,257,098	6,493,061	50.2
25-29	3,110,147	6,212,843	50.1
30-34	2,955,745	5,904,065	50.1
35-39	2,793,918	5,578,370	50.1
40-44	2,622,625	5,232,548	50.1
45-49	2,438,630	4,860,278	50.2
50-54	2,237,653	4,445,063	50.3
55-59	2,006,433	3,969,355	50.5
60-64	1,731,702	3,413,225	50.7
65-69	1,406,792	2,768,339	50.8
70-74	1,036,637	2,065,137	50.2
75-79	658,345	1,374,418	47.9
80-84	337,781	787,925	42.9
85-89	129,580	371,759	34.8
90-94	33,978	135,081	25.2
95-99	5,501	.....	...

It will be noted that during the periods of youth and middle age, when the death rate is fairly constant, the number reported in each age group is slightly in excess of the arithmetic mean of the numbers reported in the two neighboring groups. It is very improbable that an accurate table of the ages of an actual population, constituted as is the population of the United States, would exhibit any such regularity in the numerical relations of the different age groups. But if we discover a *uniform irregularity* in the

returns for different classes of the population we may safely conclude that such an irregularity is due to the manner in which ages are reported and not to the peculiar age composition of the population.

As a preliminary to the application of this test to the census returns, the ages of the population of the United States, as reported in 1890, have been grouped by three methods. The census plan is followed in the first method, a year of concentration being placed at the beginning of each group. The second method is the one suggested by Mr. Holmes, the third or median year of each group being a year of concentration. In the last method the year of concentration is placed at the end of the group. For convenience these methods will be referred to as Method I, Method II, and Method III, respectively. The following tables show the comparative numerical values of the age groups formed by these three methods for different classes of the population:—

PERCENTAGE RELATION BETWEEN THE NUMBER REPORTED IN EACH SPECIFIED AGE GROUP AND THE NUMBER REPORTED IN THE TWO NEIGHBORING AGE GROUPS, WHEN THE FIRST YEAR OF EACH GROUP IS A YEAR OF CONCENTRATION.

[*Method I.*]

Age Groups.	Aggregate Population.			Native White.		Colored.	
	Total.	Male.	Female.	Total.	Female.	Total.	Female.
5–9	51.6	51.3	51.9	58.0	58.3	52.5	53.0
10–14	49.8	50.5	49.0	49.2	48.6	52.5	51.1
15–19	49.6	48.6	50.5	50.9	51.7	49.3	50.6
20–24	52.6	52.2	53.0	51.9	51.9	51.1	51.7
25–29	48.5	48.8	48.2	46.2	46.4	49.2	48.9
30–34	50.3	51.1	49.5	52.1	51.7	43.1	42.1
35–39	49.8	50.3	49.3	49.3	48.6	56.6	55.8
40–44	48.3	47.7	48.9	47.4	47.9	45.1	47.1
45–49	49.6	49.5	49.6	49.0	49.4	50.9	50.0
50–54	52.8	52.8	52.8	51.8	51.8	55.6	55.4
55–59	44.2	44.3	44.1	47.8	44.9	38.0	36.2
60–64	54.3	54.3	54.4	52.2	52.1	59.9	62.2
65–69	46.8	46.8	46.7	47.7	47.9	43.4	41.7
70–74	50.0	50.2	49.8	50.7	50.1	51.2	54.2
75–79	43.4	43.1	43.7	44.8	45.3	40.1	39.0
80–84	43.5	42.0	45.1	44.1	45.0	50.8	55.7
85–89	33.1	31.6	34.4	33.4	35.3	32.3	31.3
90–94	29.2	27.2	30.9	25.9	27.2	47.9	51.8

PERCENTAGE RELATION BETWEEN THE NUMBER REPORTED IN EACH SPECIFIED AGE GROUP AND THE NUMBER REPORTED IN THE TWO NEIGHBORING AGE GROUPS, WHEN THE MEDIAN YEAR OF EACH GROUP IS A YEAR OF CONCENTRATION.

[*Method II.*]

Age Groups.	Aggregate Population.			Native White.		Colored.	
	Total.	Male.	Female.	Total.	Female.	Total.	Female.
8–12	49.2	49.6	48.8	48.3	48.0	51.6	50.8
13–17	49.1	49.0	49.2	50.0	50.1	49.9	50.1
18–22	52.4	51.4	53.4	52.9	53.5	50.9	51.9
23–27	48.8	48.8	48.7	46.3	46.3	50.3	50.8
28–32	52.3	53.1	51.3	52.6	52.2	47.1	45.7
33–37	47.0	47.5	46.5	48.3	47.7	45.4	44.7
38–42	52.1	51.9	52.2	49.9	49.8	58.3	60.2
43–47	46.2	45.9	46.4	46.8	47.4	39.8	39.3
48–52	53.5	52.9	54.1	51.0	51.7	64.6	66.4
53–57	46.9	47.6	46.1	48.7	47.8	37.6	34.2
58–62	49.7	49.0	50.4	47.4	47.7	58.3	63.1
63–67	50.4	51.0	49.8	51.5	51.4	42.8	39.6
68–72	48.6	48.4	48.7	48.4	48.1	54.6	58.8
73–77	45.3	45.2	45.4	47.3	47.6	37.8	36.6
78–82	44.5	43.8	45.1	44.6	44.7	54.0	58.6
83–87	37.3	35.2	39.3	38.9	41.4	32.0	31.6
88–92	31.0	29.8	32.1	28.3	29.2	51.2	53.7

PERCENTAGE RELATION BETWEEN THE NUMBER REPORTED IN EACH SPECIFIED AGE GROUP AND THE NUMBER REPORTED IN THE TWO NEIGHBORING AGE GROUPS, WHEN THE LAST YEAR OF EACH GROUP IS A YEAR OF CONCENTRATION.

[*Method III.*]

Age Groups.	Aggregate Population.			Native White.		Colored.	
	Total.	Male.	Female.	Total.	Female.	Total.	Female.
6–10	52.2	52.2	52.1	51.6	51.6	57.8	54.5
11–15	48.4	49.1	47.7	48.5	47.9	49.5	48.1
16–20	50.7	48.8	52.8	51.8	53.5	50.5	53.5
21–25	50.9	51.5	50.3	49.7	48.9	50.7	49.6
26–30	52.5	52.8	52.1	50.4	50.7	52.0	52.0
31–35	45.5	46.3	44.6	47.7	47.0	38.4	36.8
36–40	54.3	54.1	54.6	52.2	52.1	66.2	68.2
41–45	44.2	44.2	44.3	44.8	44.8	36.5	36.7
46–50	55.5	54.6	56.5	53.0	54.2	67.3	69.0
51–55	44.5	45.3	43.6	46.0	45.2	36.4	33.2
56–60	53.4	52.7	54.3	51.2	51.5	62.8	66.6
61–65	47.2	47.7	46.4	48.1	47.6	40.1	38.0
66–70	51.2	50.6	51.8	50.4	50.9	56.5	59.0
71–75	44.8	45.4	44.1	47.1	46.4	37.7	37.1
76–80	47.5	46.6	48.5	47.3	48.0	55.9	59.0
81–85	37.1	36.0	38.2	39.6	40.9	30.8	31.1
86–90	37.9	35.9	39.7	35.2	37.1	56.8	58.5

Considering the results for the total aggregate population, it appears that by each method of grouping, in the period of middle age, there is an excess in every group containing a year which is a multiple of 10, with the exception of the group 40-44. In the following tables the expression obtained for the numerical values of the groups containing multiples of 10 and of the groups containing odd multiples of 5 are placed in parallel columns. The groups used contain the years of concentration from 20 to 55: —

RELATIVE SIZES OF THE QUINQUENNIAL GROUPS FORMED FROM THE AGE RETURNS OF THE TOTAL AGGREGATE POPULATION BY THREE METHODS OF GROUPING.

Years of Concentration.	*Method I.*		*Method II.*		*Method III.*	
	Groups Containing Multiples of 10.	Groups Containing Multiples of 5.	Groups Containing Multiples of 10.	Groups Containing Multiples of 5.	Groups Containing Multiples of 10.	Groups Containing Multiples of 5.
20	52.6	....	52.4	....	50.7	....
25	....	48.5	....	48.8	....	50.9
30	50.3	....	52.3	....	52.5	....
35	...	49.8	....	47.0	....	45.5
40	48.3	....	52.1	....	54.3	....
45	....	49.6	....	46.2	....	44.2
50	52.8	....	53.5	....	55.5	....
55	....	44.2	....	46.9	....	44.5
Average	51.0	48.0	52.6	47.2	53.2	46.3

The difference between the average numerical values of the two kinds of groups shown in the foregoing table is, by Method I, 3.0; by Method II, 5.4; by Method III, 6.9. The following table shows the corresponding averages and differences for various classes of the population.

It appears from this table that the differences are uniformly smallest by Method I and largest by Method III. Remembering that these differences represent the relative inaccuracy of these different methods, we may conclude definitely that for the ages under consideration, *groups beginning with a*

COMPARISON OF THE DIFFERENCES BETWEEN THE NUMBER OF REPORTED AGES IN QUINQUENNIAL GROUPS CONTAINING AN EVEN MULTIPLE OF 5 AND IN GROUPS CONTAINING AN ODD MULTIPLE OF 5, AS SHOWN BY THREE METHODS OF GROUPING.

Classes of Population.	Multiples of 5.	Method I.	Method II.	Method III.
Total aggregate.....	Even	51.0	52.6	53.2
	Odd	48.0	47.2	46.3
	Difference	3.0	5.4	6.9
Aggregate males.....	Even	51.0	52.3	52.6
	Odd	48.2	47.5	46.8
	Difference	2.8	4.8	5.8
Aggregate females....	Even	51.1	52.8	54.0
	Odd	47.8	46.9	45.7
	Difference	3.3	5.9	8.3
Total native white.....	Even	50.8	51.6	51.9
	Odd	48.1	47.5	47.1
	Difference	2.7	4.1	4.8
Native white females..	Even	50.8	51.8	52.6
	Odd	47.3	47.3	46.5
	Difference	3.5	4.4	6.1
Total colored	Even	48.7	55.2	59.0
	Odd	48.7	43.3	40.5
	Difference	0.0	11.9	18.5
Colored females.....	Even	48.6	58.5	60.7
	Odd	47.7	42.3	39.1
	Difference	0.9	16.2	21.6

year of concentration are more accurate than groups in which the year of concentration is the median or the last year. In

other words, the tendency to return ages as less than the truth is much stronger than the tendency to return them as greater than the truth. The strength of this tendency varies greatly with the different classes of the population. This is shown by a comparison of the excess of the differences by Method III over the differences by Method I for different classes. This excess is least for the total native white (2.1) and greatest for the colored females (20.7). In general, the tables show that the tendency to report ages as less than the truth is stronger with females than with males and with the colored than with the white population.

An examination of the relative sizes of the differences for different classes of the population throws light on the question of the excessive concentration at 10-year intervals. This tendency to report ages at years which are even multiples of 5, rather than at odd multiples, is greater with females than with males and is greater with the aggregate population than with the native white population. The results of two methods of grouping indicate that it is stronger with the colored than with the white population. But by Method I the differences for the total colored and the colored females are only 0.0 and 0.9, respectively,—smaller than the corresponding differences for the native whites or the aggregate population. Reference to the table on page 32 shows that these low differences are due to the excessive size of the age group 35–39, as compared with the two neighboring age groups. The groups containing the year 35, formed by the two other methods of grouping, do not exhibit this peculiarity. On the other hand, there is a marked concentration in each group containing the year 40, except the group formed by Method I (40–44). It would appear that the four years below 40 (36–39) are excessively large as compared with the years above 40 (41–44). This is probably chargeable in part to a peculiar tendency on the part of those whose ages are greater than 40, to return themselves as less than 40. It

would seem also that the concentration on the year 40 is drawn in but very slight degree from years less than 40. This peculiarity, especially noticeable with respect to the colored population, is also traceable in the returns from the native whites and the aggregate population.

In the light of the foregoing explanation of the only part of the table that seems to be contradictory, we may conclude that the tendency to concentrate on the even, rather than on the odd multiples of 5, is much stronger with the colored than with the white population.

It should be noticed that the figures which have been presented do not afford a basis for determining the percentage of inaccuracy of any age group or method of age grouping. The method used is valid only for comparative purposes. Neither is it practicable to apply this method to other than quinquennial groups, as its basis is the excess of concentration on the even multiples of 5 over that on the odd multiples of 5. A decennial group, for example, must contain both an even and an odd multiple of 5, and a series of such groups cannot be studied to advantage by this method. The conclusions which have been reached as to the direction of concentration would seem to have some bearing on the question of the relative accuracy of various forms of decennial age groups.

The method used has another limitation in being applicable to the study of only a portion of the age table. Above 60 years the increase of the death rate is so rapid that a study of the comparative sizes of age groups can hardly lead to trustworthy conclusions. But this part of the population is comparatively small and, from an economic standpoint, comparatively unimportant. It seems probable, however, that the generally accepted opinion, that persons advanced in years very commonly overstate their ages, is entirely correct. In the early years of life also there are rapid changes of the death rate. As the age returns show no marked con-

centration on multiples of 5 below 20, it has been thought best in this study to disregard these lower ages.

Summary of Conclusions.

1. More persons return themselves as younger than they are than as older than they are. This is true for both sexes and for all classes of the population. This tendency is strongest in the colored population and is least marked in the native white population. For all classes the tendency is more noticeable in women than in men.

2. On account of the tendency to report ages as less than the truth the years of concentration are preferably placed at the beginning of the quinquennial groups.

3. A number of persons who are over 40 years old report themselves as under 40. This is true for all classes, but is especially noticeable with the colored population. It also seems probable that very few persons less than 40 years old report themselves as 40.

4. The results of this study throw some light on the question of the relative desirability of a quinquennial or some other system of grouping. The English census of 1891 used decennial groups, explaining that "if ages be grouped by given quinquennial periods the figures for the successive quinquennia are too high or too low, accordingly as they include or do not include a year that is an exact multiple of 10. Therefore . . . it is better for such purposes as require accuracy . . . to make use preferentially of decennial periods, and to arrange them in such a way that the year which is a multiple of 10 shall come in the middle of the period; that is to say, to use such age periods as 25–35, 35–45, etc., rather than 30–40, 40–50, etc." *

It has been shown that the accuracy of a series of quinquennial groups depends very largely on the form of group used. It does not seem that the inaccuracy of the form of

* *Census of England and Wales*, 1891, General Report, p. 27.

quinquennial groups used in the United States census is sufficient to warrant the substitution of the less convenient decennial groups. The choice of the form of decennial group used in the English census was evidently made on the assumption that the wrongly reported ages are drawn equally from above and below the year of concentration. It has been shown that, for the United States at least, this assumption has no basis in fact. There is room for considerable doubt as to whether the decennial groups used in the English census are more accurate than the quinquennial groups used in the United States census.

AIDS IN THE USE OF GOVERNMENT PUBLICATIONS.

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The largest publishing concern in America is the United States government, the output of the government printing office amounting in a single year to more than a thousand distinct items. These issues are, however, less appropriately distributed and less convenient for consultation than almost any other kind of printed matter that is manufactured. These facts have been frequently pointed out by those who have had to do with public documents, and there have been some improvements in the government's methods in recent years. Much remains to be striven for, but the object of this paper is to show the present situation and to point out what helps may be made use of by those who consult government publications.

A great many government issues are, of course, official reports of the work done by the various bureaus and divisions of the departments, having the same place among government publications that reports of institutions or stock companies have among the issues of private publishers. These are of interest only to students of administration and investigators of special topics, save as it is the duty of every citizen to exercise a close oversight over his servant, the Government. Moreover, as in every report intended to show amount of work accomplished and the existing condition of a business, it is chiefly in these annual departmental reports, with the appendices, that the original and detailed statistical statements are to be found, likely to be of particular interest to the readers of this paper. The investigator's ability to find the information he desires in the departmental reports will depend largely upon his knowledge of the organization of

the government, of the different bureaus and divisions which exist, the duties performed by each, and the department to which each is subordinate. As there are constant changes in names, affiliations, and assignments of duties, from year to year, and as there are some confusing similarities or identities of name and duties between analogous offices of different departments, it will probably be desirable to gain a general view or refresh one's memory as to these matters by the preliminary step of going carefully through those pages of the latest congressional directory* which describe the organization of the executive departments, their sub-divisions, and duties. It will be well also to glance through the list of chiefs of divisions and sections, as this list will hint more systematically and specifically at the kind of matter that may be looked for in each departmental report. It would serve a useful purpose also to examine in the last annual report of the public printer the list of documents printed upon requisitions of heads of executive departments.

The official annual reports of the subordinate offices are included as appendices in the complete editions of the reports of the heads of the several executive departments,— the members of the Cabinet. There are a few cases only in which the separate edition of the report of the subordinate office contains matter not included in the report when it appears as an appendix to the annual report of the head of the department. There are, however, four permanent branches of the government of which the heads, although not members of the Cabinet, report directly to the President, and are not subordinate to any of the executive departments,— the Department of Labor, the Commission of Fish and Fisheries, the Civil Service Commission, and the Interstate Commerce Commission, from each of which there come one or more volumes of annual reports every year. It should be noted that the annual reports of the members of the Cabinet are

* To be procured of the Superintendent of Documents, 35 cents (cloth).

also issued in an earlier, separate form, without the appendices, even though the title pages of the preliminary pamphlet and the final bulky volume may be precisely the same, so that, for example, in calling for the latest report of the Secretary of the Treasury upon the state of the finances, at a library or elsewhere, one may not be sure whether he will receive the volume of 800 pages or more, including the desired statistical tables, or a pamphlet of 150 pages. Furthermore, there are at least two editions of the departmental report in the complete form,—the "departmental edition,"—issued upon requisition of the head of the department for its use, unbound or bound in cloth in one or more volumes, and the congressional edition, issued in the "public documents" or "sheep-bound" set, for the use of members of Congress and distribution by the superintendent of documents under the direction of Congress to "designated depository" libraries throughout the country. (Strictly or technically speaking, only the congressional editions are "public documents"; the other issues are "government publications" not "public documents.")

In the congressional series the departmental reports usually appear as transmitted to Congress by the President, and are "executive documents." All the public documents of each session of each Congress are divided into Senate and House documents and reports. The departmental reports in each case are executive documents, being thus distinguished from the miscellaneous documents (or communications made to Congress from other sources than through the President or from its own committees) and reports (of committees to the Senate or House, or both). This distinction has not always been carefully observed, and the arrangements and designation have varied somewhat in former years. The distinction between executive and miscellaneous documents is dropped in the public documents of the 54th Congress (December, 1895), and since then all the documents are put

in four groups,— Senate documents, Senate reports, House documents, House reports.

As messages from the President transmitting reports from executive offices are sent to both houses simultaneously, it was formerly the case that the same report would appear twice in the documents of a session, once as a Senate executive document, and once as a House executive document. Since 1858, however, it has been customary for the public printer, who assigns the numbers to documents in the order in which the manuscript for each reaches him, to print the document as Senate or House according to which copy reaches him first, and to omit the other. There is an increasing tendency towards system and uniformity, however, and for recent years the same document will generally be found in about the same place each year.

I take so much time to explain the nature and arrangement of the public documents, or "sheep-bound" set, because it is in this set that a fairly complete collection of continuous files of government publications can most readily be found. As aforesaid, the set has of recent years been distributed to the depository libraries quite widely throughout the country. The depository libraries have included many of such meagre capacity that the public documents have been more of a burden than a boon to them, and have been packed away in disorder in garret or cellar in spite of the condition imposed by law that depositories must grant to the public free access to the documents. A list of the depositories may be found in the annual report of the superintendent of documents, which is both issued separately and included in the report of the public printer.

As the congressional directory will serve as an indicator of the scope and nature of the executive documents, all of which will be included in the public documents, the great guide book to the contents of the whole public documents series is the government *Checklist*. The first edition of this

was compiled by John G. Ames, then superintendent of documents in the Department of the Interior, 1892. The second edition, constructed on the same plan, much enlarged and improved, was issued in 1895, by F. A. Crandall, Doctor Ames' successor as superintendent of documents, when that position was transferred from the Department of the Interior to the government printing office, and came under the direction of the public printer, who is an agent of Congress directly responsible to it through the joint committee on printing. Doctor Ames remained clerk in charge of documents in the Interior Department, and stills prepares an annual report which is printed regarding the receipt, distribution, and sale of public documents by that department. The present superintendent of documents, L. C. Ferrell, Mr. Crandall's successor, in his annual report recently issued, promises a third and still further improved and enlarged edition of the *Checklist*, with many important additions. In an official letter since the report was published, dated February 13, 1900, he says that this new edition may not be expected for a year. The first and second editions are unfortunately out of print, and sad to relate, the *Checklist* cannot be found in the public documents themselves, never having been issued as a congressional document. It can, however, probably be found in every "designated depository" library.

The *Checklist* is not an alphabetical index to the contents of the public documents, but is a convenient octavo volume of 222 pages, of which the main part is as the name indicates a list of the volumes of the "sheep-bound" set, in the order in which they should be arranged upon the shelves in a library, that is, of all the volumes as far back as any ordinary library is likely to have the set, and as far as it was possible to make a fairly accurate inventory. There is nowhere in existence an approximately complete collection of United States government publications, nor anywhere a complete collection of even the public documents set. The larger,

older libraries have the best sets, and there are probably better sets elsewhere than are to be found in any of the collections in Washington with the exception of that of the Department of State. The superintendent of documents is collecting a library of United States government publications, but lack of facilities prevents him from opening it for public use. The *Checklist* is chiefly valuable, however, for the appendices which it contains. The most important of these is a list of the principal annual reports that have been issued, with reference to the volumes in the congressional documents set where each may be found. The reference is by means of the "serial numbers" attached to the entries in the *Checklist* proper, which serve as volume numbers to the set as a whole. These begin with the documents of the 15th Congress and reached in the *Checklist* issued in 1895 to the number 3344, going through the 53rd Congress which ended in March, 1895. The volumes now issued have serial numbers gilded on their backs, in continuation of those assigned to the earlier volumes in the *Checklist*, greatly facilitating their arrangement on the shelves as they come, for they are issued very irregularly, some not being bound and distributed until three or four years after adjacent volumes. Second in importance in the *Checklist* is a list of catalogues and indexes published by the government which may be used in seeking information about government publications and their contents. It contains also inventories of the volumes issued of United States statutes and of the various series, "Annals of Congress," "Register of Debates," "Congressional Globe," and "Congressional Record," which record the debates in Congress, also of the Journals of the Senate and of the House of Representatives, which give the mere skeleton of the proceedings, but are the authoritative record of the votes; these are issued in the congressional documents set, and in the *Checklist* each is placed at the beginning of the documents of the chamber to which it

refers, for each session, but some librarians keep the journals in a separate file and certain issues have failed to receive serial numbers. The *Checklist* describes also the important reprints of early documents known as American State Papers, and American Archives, and, in general, is the very best single guide for users of documents. The advent of the promised new addition is to be eagerly awaited.

Unfortunately, as has been already hinted, all government publications are not included in the congressional series or public documents proper. The whole mass of government publications may be classified according to their purpose as follows: —

I. Congressional documents. These are published by Congress (*a*) to aid it in the transaction of its legislative business and insure the preservation of authoritative records, or (*b*) to gratify the constituents of the several members. Under Class I (*a*) are: 1. Reports and papers from the executive departments already discussed; 2. Communications received by Congress, results of special investigations undertaken in accordance with its will, memorials, petitions, etc.; 3. Reports of congressional committees, standing and special, upon bills referred to them, etc. Under Class I (*b*) are documents intended to instruct and interest the people to whom they are distributed: 1. Information of practical value, such as the constituents would be willing to buy of private publishers, furnished free, however, to favored constituents through the public printing office and the franking privilege; 2. Memorials, petitions, and reports of societies and individuals which they are glad to have printed at the expense of the government. Of course the same document may serve two purposes.

II. Publications of the executive or judicial branches of the government. These are also either (*a*) intended to aid the officers of the government in the performance of their duties, or (*b*) to furnish the private citizen with information

needed, either in his relations with the government or in the conduct of his private affairs for the betterment of his condition and the increase of the public weal. The largest number of government publications which never become public documents and do not reach libraries and private citizens belong in Class II (*a*). These include manuals and circulars containing information and instructions, such as rules of procedure, records of decisions, regulations to secure uniformity in practice in different places, practical manuals of methods, tactics, etc., information as to conditions and methods in similar work under other governments, and digests, reference lists, and compilations of various kinds. Some of these are transmitted to Congress and may be found in the public documents, and of late years any surplus copies of such works are turned over to the superintendent of documents for distribution to libraries or sale to private citizens. Many of these would be of great general interest and usefulness. Class II (*b*) includes: 1. Instructions for applicants or attorneys of applicants for patents, claims, pensions, copyrights, passports, admission to the civil service or to the naval or military academy, etc.; 2. Scientific, technical, and sociological monographs and reports, issued either by the institutions established expressly for the furtherance of such studies, such as the Smithsonian Institution, the Naval Observatory, and the Department of Labor, or by other offices created to promote certain definite practical interests, such as the Fish Commission, the Department of Agriculture, and the Bureau of Education, in connection with their work; 3. Popular treatises, intended to aid the farmer, merchant, or manufacturer in his business, or the student of social problems in getting at the facts, and thus to increase the general prosperity and accelerate the progress of the country. In this class would be included such issues as the invaluable "Annual Statistical Abstract of the United States," compiled in the Bureau of Statistics of the Treasury Department,

an epitome of all the statistical information furnished by the various government bureaus (thus serving to indicate upon what subjects more full and detailed statements may be found), with additional matter, convenient in arrangement and size, furnishing all the statistical information the ordinary inquirer will desire.* Most of the monthly issues of the government also belong in this class, such as the monthly Consular reports, issued from the Bureau of Foreign Commerce of the Department of State, giving facts as to markets in foreign ports for the advice of merchants and manufacturers, and the Monthly summary of the commerce and finance of the United States, issued by the Bureau of Statistics of the Treasury Department, which serves to show bankers and merchants the exact condition of the country as regards exports and imports of money and goods month by month. Here also are to be classified such issues as the Department of Agriculture's Farmers' bulletins which are widely distributed.

Having now reviewed the general scope and nature of government publications we are prepared more intelligently to consider how the material contained in these multitudinous issues may be got at when it is wanted,—what indexes are available. The first great index to government publications is that compiled by Ben: Perley Poore, published in 1885, a monumental work of 1392 double-column pages of fine print in quarto size, purporting to be "A *descriptive catalogue* of the government publications of the United States, September 5, 1774, March 4, 1881." It appears in the congressional set as serial No. 2268 (48th Congress, 2d session, Senate misc. doc. No. 67). The main body of the work is a list of brief entries under subject heads in bold type, arranged, however, not by subjects, but in chronological order by date of publication. There is a subject and personal index at the end of the volume with references to pages where entries

* For sale by the Superintendent of Documents, 25 cents (paper).

appear of publications issued upon the subject mentioned. To find the entries it is necessary to look through the whole page of fifty or more titles. Moreover, Mr. Poore did not succeed in including quite all the government publications of the period mentioned, and errors have crept in. However, this is the only means of finding obscure documents of unknown date, and we should be thankful that we have it. Note that it purports to cover all government publications, whether included in the congressional set or not. If it is known of any document desired that it was included in the congressional set, and if it is further known when it was issued, and whether it was House or Senate, and executive or miscellaneous, document, or report, it may be found in the appropriate index. For the congressional documents of each Congress until the 54th, December 2, 1895, there are six indexes for each session, one each for House executive documents, House miscellaneous documents, House reports, Senate executive documents, Senate miscellaneous documents, Senate reports. A copy of the index for the whole group to which it belonged was bound in each volume of the group, provided the volume was of the ordinary size. Since 1895, however, there have been issued "consolidated indexes," one for each session of Congress in a separate volume covering all the documents and reports of both Senate and House.

Poore's catalogue has been supplemented by Ames' "*Comprehensive Index* of the Publications of the United States Government, 1889–93," and by the catalogues of public documents issued by the superintendent of documents since 1895, of substantially the same character as Ames' work, with improvements of form, of which two issues have appeared covering the periods March 4, 1893, to June 30, 1895 (53d Congress), and July 1, 1895, to June 30, 1896 (54th Congress, 1st session), respectively. These three catalogues are models of excellence in clearness, completeness, and accuracy. The two latter are strictly alphabetical,

including both subject and author entries in a single alphabet, give fairly full titles, and include all the different editions issued of each work. It will be noticed that the interval between Poore and Ames, 1881–89, is not covered. A catalogue to fill the hiatus has been ordered by Congress and is in course of preparation. (Joint resolution, March 3, 1897.)

The catalogues and indexes thus far mentioned are the primary sources of general information regarding United States government publications. In connection with them the monthly catalogue of United States public documents, issued by the superintendent of documents, must be noticed. This began January, 1895, and was preceded by Hickcox's United States government publications, monthly catalogue,—a private enterprise, conducted from 1885–94. The monthly catalogue as now issued includes a complete list of all United States government publications, month by month, including reprints and various editions, arranged by the branch, department, bureau or division of issue, with statement of price if obtainable by purchase from the superintendent of documents. Each number of the catalogue has an excellent index, so that this publication serves as a guide to documents issued too recently to appear in any of the previously mentioned catalogues or indexes. Unfortunately, the edition of the monthly catalogue is so limited that it is difficult for private individuals to obtain it. The public documents bill that has been submitted by the public printer for consideration of the present Congress provides that additional copies may be printed for private subscribers at sixty cents per annum, and in his last annual report the superintendent of documents announces a plan of making the index of the monthly catalogue "cumulative." If this can be done, and the proposed bill becomes a law, the condition of affairs as regards government publications will be immensely improved and will begin to approach the ideal state. The bill includes also a provision to insure the des-

ignated depositories receiving all government publications, whether congressional documents or not. At present the libraries receive only such of the latter class as are furnished to the superintendent of documents for distribution to them, or such as they receive by special favor directly from the office of authorship or publication, and they fail to receive many issues. No effort should be spared that may help to gain the passage of the bill. A copy of it may be found in the *Library Journal* for February, 1900, pp. 65–67.

When by means of the helps thus far mentioned the investigator has found out what government publications have been issued, bearing upon or likely to contain information bearing upon the subject that interests him, and when and from what office these documents have appeared, it will remain to select from among the multitude of titles a few to be first looked up. For this purpose some of the special catalogues or indexes issued by the various departments may be needed. As aforesaid, a list of these is given in the government *Checklist*. I append to this paper for convenience a list of reference books mentioned and some other aids, and also of a few of the more important government indexes and lists which have appeared since the *Checklist* was compiled.

The publications of the various States are quite as perplexing, in proportion to their number, as those of the United States. The best source of information concerning them will be the "provisional list," entitled "State publications," issued from the office of the *Publishers' Weekly*,* of which Part I: New England States, has already appeared. This may be supplemented by some of the publications of some of the State libraries, as the State libraries have a practice of exchanging the publications of their respective States with each other, and hence have more complete sets of them than libraries of other kinds. The annual supplement to the catalogue of the Massachusetts State library, issued in

* New York.

connection with the annual report of the librarian, is particularly good, as it is strictly alphabetical.

When the exact volume wanted is precisely known, there still remains one more thing to be achieved by the inquirer, namely, to lay hands on a copy of the document! When that is done, the struggle is probably over, for government publications are fairly well provided with individual tables of contents and indexes. But to lay hands on a copy of the document may not be so easy as it would seem that it should be. In the first place, as aforesaid, no library has received all government publications. In the second place, if the document wanted is not in the congressional set, it remains to be discovered where in the library it is kept, if the library has it. Perhaps a few words on the cataloguing of goverment publications not included in the "sheep-bound" set may be in place here. Most American libraries have card catalogues which are the chief guides to their contents. For ordinary books this catalogue usually meets the need of inquirers admirably with its entry under author, subject, or title. Goverment publications, however, are peculiar in that author and title entries for these are of little or no use in helping searchers to find them, and the assignment of appropriate subject entries is often very difficult. Librarians have directed much discussion to this problem, but it still remains perplexing. An especially unfortunate thing is that some of the oldest and largest libraries, which have the most nearly complete collections of documents, are the worst off as to catalogues of them, for these two reasons: First, having commenced their work before the development of carefully adapted methods their system of cataloguing is inferior, as they have felt constrained for consistency's sake to continue the old method; second, because of the great size of their collections they have deemed it impracticable not only to alter their system, as that would entail going over again an immense extent of ground, but even, because of their multi-

tude, to catalogue the currently received documents with the great care and fulness necessary to make them entirely available. This is notably the case, especially in the former respect, in the Boston public library, which has probably one of the most complete collections of United States government publications, but where the card catalogue, in so far as these publications is concerned, is desperately bad. It is an almost hopeless undertaking for anyone not familiar with the practice of the library to attempt to find any government publication in the card catalogue, and even the members of the staff sometimes despair as to particular kinds of documents. Although the catalogue is otherwise constructed throughout upon the dictionary or alphabetical plan, under names of countries there are *three* different sets or files of cards, each file arranged independently, and the cards of the first group are arranged not alphabetically, but "hierarchically." If a searcher has studied the *Handbook for Readers* carefully, and is familiar with the organization and relations of the departments of the government and their subdivisions, he may be able to make use of the catalogue. Otherwise he would do better to ask an attendant to consult it for him without delay. The old printed catalogue and supplement include an index to the congressional documents, and this was continued in manuscript on slips for a long time afterwards, but was finally abandoned and is now inaccessible.

Furthermore, cataloguers are apt to imagine that there is a legitimate name for each government subdivision which must be used as in the case of individuals and incorporated bodies. In fact, this is not the case, and for government-author entries such names as seem most likely to be permanently serviceable should be arbitrarily adopted, and when adopted should be pertinaciously adhered to, with "*See*" references to the form adopted from the various names that the publications of the bureau appear under. The Boston public library is a flagrant offender in this matter of attempt-

ing to follow all the vagaries of name of different bureaus and of the same bureau at different periods. Libraries probably could not do better than to adopt as models in their cataloguing of government publications the methods used in the latest issues of the *Comprehensive Catalogue*, issued by the superintendent of documents, described above, especially adopting for headings the forms of names of government bureaus as authors given in the list appended at the end of each volume. That is, the names of government bureaus as authors should be so inverted that the entries will be arranged in the alphabetical file of cards by the most significant word in the name, as suggested in Linderfelt's rules, §180, not by some such insignificant word as Board, Department, Bureau, Division, Commission, etc., and the same name should always be used for the same bureau, even though it may appear under different names on the title pages of different publications according to the whims of the successive chiefs.

Finally, these headings, thus adopted, should be thrown into a single alphabet under the name of the country, along with the subject entries for the country, so that there will be but one possible place for any given entry.

SELECT LIST.

PRINCIPAL GUIDES.

U. S. Documents Office.

Checklist of public documents containing debates and proceedings of Congress from the first to the fifty-third Congress, together with miscellaneous lists of documents and historical and bibliographical notes. Second edition, revised and enlarged. Issued by F. A. Crandall, superintendent of documents, government printing office. Washington, 1895; 222 pp., 8vo.

Poore, Benjamin Perley.

A *descriptive catalogue* of the government publications of the United States, September 5, 1774–March 4, 1881. Washington, 1885; iv, 1392 pp., 4to.

Ames, John Griffith.

Comprehensive index of the publications of the United States government, 1889–93. Washington, 1894; vi, 480 pp., 4to.

This covers the 51st and 52d Congresses. It contains (1) a list of titles, alphabetically arranged by subjects, with full information attached to each as to author and source of issue, (2) a personal index.

U. S. Documents Office.

Catalogue of the public documents of . . . Congress and of all departments of the government of the United States for the period March 4, 1893, to June 30, 1896 (being the "*Comprehensive index*" provided for by the act approved January 12, 1895). Prepared under the supervision of the superintendent of documents, government printing office. Washington, 1896, 1898; 2v. 4to.

Contents: 53d Congress; 54th Congress, 1st session.

U. S. Documents Office.

Catalogue of United States public documents. Issued *monthly* by the superintendent of documents, government printing office. No. 1–60. January, 1895–December, 1899. Washington, 1895–99; 5v. 8vo.

For 1900, the index of each monthly issue covers all previous numbers of this year.

U. S. Documents Office.

Index to the subjects of the documents and reports and to the committees, senators, and representatives presenting them, with tables of the same in numerical order (being the "*Consolidated index*" provided for by the act of January 12, 1895). Compiled under the direction of the superintendent of documents, 54th Congress, 1st session–55th Congress, 3d session; December 2, 1895–March 4, 1899. Washington, 1897–1900; 5v. 8vo.

SPECIAL GOVERNMENT LISTS ISSUED SINCE THOSE INCLUDED IN THE CHECKLIST OF 1895.

[Hasse, Adelheid Rosalia.]

List of publications of the U. S. Department of Agriculture from 1841 to June 30, 1895, inclusive. Washington, 1896; 76 pp. [Department of agriculture. Library. Bulletin. 9.] 8vo.

This is already out-of-date on account of the extreme fecundity in printed matter of the department.

U. S. Publications Division. (Agriculture Department.)

Index to the annual reports of the U. S. Department of Agriculture for the years 1837 to 1893, inclusive. Washington, 1896; 252 pp., 8vo.

This constitutes Bulletin 1 of the Department of agriculture Division of publications.

Thompson, George Fayette.

Synoptical index to the reports of the statistician [of the Depart-

ment of agriculture] 1863 to 1894. Washington, 1897; 258 pp. [Department of agriculture. Division of publications. Bulletin. 2.] 8vo.

Thompson, George Fayette.

Index to authors with titles of their publications appearing in the documents of the U. S. Department of agriculture, 1841 to 1897. Washington, 1898; 303 pp. [Department of agriculture. Division of publications. Bulletin. 4.] 8vo.

U. S. Coast and Geodetic Survey. (Treasury Department.)

Bibliography. Descriptive catalogue of publications relating to the U. S. Coast and geodetic survey, 1807 to 1896 . . . Washington, 1898; 118 pp. [Special publication. 2.] 8vo.

U. S. Documents Office.

Bibliography of United States public documents relating to interoceanic communication across Nicaragua, Isthmus of Panama, Isthmus of Tehuantepec, etc. Prepared in the office of the superintendent of documents, government printing office. Washington, 1899; 29 pp., 8vo.

U. S. Documents Office.

Price list of U. S. public documents for sale by the superintendent of documents, government printing office, Union building, Washington, D. C. Third edition. May 1, 1900. Washington, 1900; 142 pp., 8vo.

U. S. Experiments Stations Office. (Agricultural Department.)

List of publications of the office of experiment stations and the several stations. (In its Bulletin. 80. Washington, 1900; pp. 508–623.)

OTHER SOURCES OF INFORMATION.

1. OFFICIAL.

Ames, John Griffith.

Special report relative to public documents. Washington, 1894; 19 pp. [Superintendent of documents, Department of the Interior.] 8vo.

A complete, clear, and vigorous statement of then existing conditions and plea for needed reforms.

U. S. Government Printing Office.

Annual report of the public printer for the year ending June 30, 1894–99. Washington, 1895–99; 6v. 8vo.

This includes the report of the superintendent of documents. The report gives lists of documents printed for Congress and upon requisition from the heads of departments, with the cost, size of editions, etc., lists of "designated" and other depository libraries, and much other information.

U. S. Documents Office.

Annual report, 1st, 2d, 4th, 5th, of the superintendent of documents for the fiscal year ended June 30, 1895, '96, '98, '99.

Washington, 1895–1900; 4 pph. [Government printing office.] 8vo.

The 3d report, 1897, was not issued separately; it can be found in the report of the public printer for that year.

2. UNOFFICIAL.

Bowker, Richard Rogers.

United States government publications. (Library journal. New York, 1885; vol. 10, pp. 236–241.)

An enlightening historical and descriptive sketch with references to catalogues and indexes.

Channing, Edward, and Albert Bushnell Hart.

Indexes to public documents, 1776–1895. (In their Guide to the study of American history. Boston, 1896; pp. 38–39.)

This claims to be "a nearly complete list of aids."

Ford, Paul Leicester.

Some materials for a bibliography of the official publications of the Continental Congress, 1774–89. Boston, 1890; 31 pp. [Boston. Public Library. Bibliographies of special subjects. 6.] 8vo.

This indicates in what libraries documents mentioned may be found.

Greely, Adolphus Washington.

Public documents of the early Congresses. Washington, 1897; (1) 1109–1248 pp., 8vo.

Reprinted from the annual report of the American Historical Association for 1896, vol. 1. An essay with bibliographical lists appended, including a list of indexes of public documents.

Hasse, Adelheid Rosalia.

The nation's records. (Forum. New York, 1898; vol. 25, pp. 598–602.)

A clear and forceful presentation of the deplorable failure of the United States to preserve, collect, or arrange its official records.

Hickcox, John Howard.

Serial, technical, and scientific publications of the government. (Library journal. New York, 1897; vol. 22, pp. 16–17.)

This mentions 104 publications not issued as Congressional documents.

Macdonald, William.

Bibliographical note. (In his Select documents illustrative of the history of the United States, 1776–1861. New York, 1898; pp. xi–xiii.)

An excellent guide for historical students.

McKee, Thomas Hudson.

Note on the classes and printing of United States public documents. (Library journal. New York, 1885; vol. 10, pp. 241–244.)

Mr. McKee writes as clerk of the United States Senate document room and explains many perplexing matters.

Willoughby, William Franklin.

Statistical publications of the United States government. Philadelphia, 1891; 92–104 pp. [Publications of the American academy of political and social science. 35.] 8vo.

Reprinted from the Annals, vol. 1. A readable essay, not perfectly comprehensive.

MISCELLANY AND NOTICES.

THE PAUPER ABSTRACT OF MASSACHUSETTS.

Twenty-first Annual Report of the State Board of Charity of Massachusetts. Boston. January, 1900.

The statistical tables appended to the last report of the Massachusetts State Board of Charity show some interesting improvements over the summaries published in previous volumes. The first table in the abstract contains as usual records of the sums spent for support and relief by each city and town, sub-divided according to the nature of the relief and the sort of institution concerned. An instructive new feature, however, is the column of figures showing the net amount of ordinary expense for pauper support and relief for the year ending March 31, 1899, per inhabitant, as given by the census of 1895, and the accompanying column which gives the rank of the cities and towns on the basis of this per capita expenditure. The variation is very wide,— from Gosnold which has no pauper expense, Windsor where the expense is .01 per capita, and Gill, Gay Head, Holland, and Littleton where it is .07, .12, .13, and .19, respectively,— up to Burlington where the per capita cost is $3.03, and Brewster, Yarmouth, Cohasset, and Halifax where the figures are $2.68, $2.58, $2.51, and $2.44. The averages by counties range from $0.82 in Middlesex to $1.72 in Nantucket, and $1.46 in Barnstable, the highest value for a county of considerable size; the average for the state is exactly $1.00.

The second table, giving the numbers of persons supported and relieved in the various cities and towns, is also improved by a calculation of average values, a column of figures being introduced to show the whole number of paupers, including vagrants, per 1000 inhabitants. Here the range is from Gay Head and Gosnold, where there were no paupers assisted during the year, and West Tisbury, Dover, Lincoln, and New Braintree where the numbers were 4.3, 4.5, 5.4, and 5.5 per 1000, respectively, up to Yarmouth with 84.6 paupers per 1000, Fall River with 84.1, and Marlboro, Woburn, and Chelsea

where the corresponding figures are 82.7, 76.4, and 74.3, respectively. The figures for counties vary from 19.6 paupers per 1000 in Dukes, and 25.6 in Norfolk up to 53.7 in Bristol. The average for the state is 36.6 paupers per 1000 inhabitants. It is to be noted that in all these calculations the pauper statistics of 1898–99 are compared with the population for 1895, so that the absolute numbers are in most cases excessively high.

The third important innovation is in the third table of the report which concerns the treatment of the various classes of paupers in each city and town. In the *Twentieth Report* of the Board the number of children under 16, the number of idiotic persons and of insane persons were given, with the proportion of children cared for in almshouses. In the new report the total number of paupers is first divided into into the sane and the mentally defective, the former class being sub-divided into those under and over 16, the latter into the insane and the idiotic. Under each of the first two sub-classes the number of persons cared for in almshouses and in other institutions, those relieved in their own homes, and those boarded in other private families, is given. The mentally defective are divided into those cared for in almshouses, those treated in hospitals, asylums, and schools for the feeble-minded, and those boarded in private families. The general policy of each city and town in dealing with its pauper population is thus shown in a clear and comprehensive manner.

C.-E. A. Winslow.

ROUND NUMBERS.

The tendency of the maxima in any series of estimated numbers to collect about even numbers, or multiples of ten, or any round numbers which catch the attention of the unscientific observer has been pointed out in many instances. It shows itself most clearly perhaps in estimates of the ages of illiterate populations where maxima are always found at the ten-year periods. Dr. Edward D. Jones brought out some interesting points of this sort in connection with commercial statistics in these *Publications* for 1896 in a paper on "Round Numbers in Wages and Prices."

Some such effect of the "personal equation" may be noted in the following table which is taken from Dr. Francis H. Herrick's invaluable monograph on "The American Lobster," published by the U. S. Fish Commission in the *Bulletin* for 1895. The figures showing the number of eggs in lobsters of various sizes are omitted, the numbers of lobsters of various sizes examined being alone of interest in this connection as showing the large apparent excess of lobsters whose length was in even inches over those whose length was in even half-inches, and the excess of the latter over the animals of intermediate size.

TABLE 15. (PAGE 51, "THE AMERICAN LOBSTER.")

Length of Lobster.	Number of Lobsters Examined.	Length of Lobster.	Number of Lobsters Examined.
Inches.		*Inches.*	
8	6	12 3-4	12
8 1-4	2	13	321
8 1-2	3	13 1-4	5
8 3-4	3	13 1-2	146
9	143	13 3-4	2
9 1-4	35	14	426
9 1-2	241	14 1-2	90
9 3-4	55	15	280
10	514	15 1-4	1
10 1-4	61	15 1-2	45
10 1-2	532	15 3-4	3
10 3-4	45	16	103
11	568	16 1-4	1
11 1-4	43	16 1-2	13
11 1-2	307	17	30
11 3-4	11	17 1-2	3
12	414	18	7
12 1-4	8	19	4
12 1-2	156		

C.-E. A. WINSLOW.

THE FATALITY OF CERTAIN DISEASES.

The following is taken from the *Boston Medical and Surgical Journal*, April 26, 1900: —

In consequence of the enactment of improved laws and regulations, and the better enforcement of laws which had long existed but had

hitherto been neglected, the practice of notification of infectious diseases has made it possible to determine the fatality of such diseases with a considerable degree of accuracy. The application of these results gives a greater degree of certainty to the prognosis of disease.

It should be noted, however, that all percentages derived from statistics of this character are probably a little too high, since the registration of deaths as now conducted in the States and cities included in the list is more perfectly enforced than the notification of cases, many mild cases escaping notification, especially those of scarlet fever and measles.

The following extract comprises the substance of the returns to certain inquiries sent out by the United States Commissioners to the Paris Exposition of 1900, and compiled under their direction : *

In consequence of inquiries sent out in 1899 information was secured in regard to 619,765 reported cases of small-pox, typhoid fever, scarlet fever, diphtheria, and measles, which occurred in the years 1894, 1895, 1896, 1897, and 1898, together with 75,715 registered deaths from these diseases which occurred in the same years. These were reported by the following States and cities : —

STATES.†

Massachusetts,	1894–98	Vermont,	1896–97
Michigan,	1894–98	Connecticut,	1898
Rhode Island,	1894–98	Indiana,	1898

CITIES.

New York City,‡	1894–98	Reading,	1894–98
Chicago,	1894–98	Hudson Co., N. J.,	1894–98
Philadelphia,	1894–98	Cincinnati,	1894–97
Pittsburg,	1894–98	St. Louis,	1894–97
Cleveland,	1894–98	Baltimore,	1894–97
New Orleans,	1894–98	Milwaukee,	1895–97
Minneapolis,	1894–98	Rochester,	1894–97
St. Paul,	1894–98	Denver,	1894–96
Buffalo,	1894–98	San Francisco,	1898
Toledo,	1894–98		

The results of the returns received from the foregoing States and cities are as follows : —

* Public Hygiene and State Medicine in the United States, p. 21.

† The returns of several large cities (Boston, Worcester, Providence, Detroit, Hartford, New Haven, and Indianapolis) are included in the statistics of these States.

‡ Including the figures of the consolidated city for 1898.

Diseases.	Reported Cases.	Registered Deaths.	Fatality (Per cent).
Small-pox	9,222	2,385	25.8
Typhoid fever	69,758	13,284	19.0
Diphtheria and croup	195,783	44,411	22.7
Scarlet fever	117,847	9,211	7.2
Measles	217,755	6,424	2.8
Total	619,765	75,715	

These results agree fairly well with those of the English Local Government Board for the eight years 1890–97, which showed a fatality for typhoid fever of 18.05 per cent, for diphtheria of 23 per cent, and for scarlet fever of 4.9 per cent.

In the compilation of these figures it was found necessary to reject the returns of several entire States and cities, in consequence of manifest deficiency in the number of reported cases.

The use of antitoxin for the treatment of diphtheria became general in the early months of 1895 throughout the country. If, therefore, the returns for the year 1894 be treated separately it appears that there were 25,844 reported cases, and 7654 deaths in that year, the fatality being 29.6 per cent, while the fatality of the remaining years was only 21.6 per cent.

Treating the year 1898 in the same manner, the fatality was only 20.5 per cent, or the ratio of 31,494 cases to 6471 deaths. In two States and seven cities combined, having a total population of 4,250,000, the fatality from diphtheria in 1894 was 29.7 per cent, and in the same places in 1898 it was only 14.6 per cent, confirming the statement that the diphtheria fatality has been cut in twain since the general introduction of antitoxin treatment. It is also quite noteworthy that in several large cities, situated a thousand miles apart, the diphtheria fatality before 1895 was quite uniformly from 29 to 30 per cent.

DANISH LABOR STATISTICS.

The *Nationalökonomisk Tidsskrift* (1ste Hefte, 1900) quotes figures from the *Statistiske Medelelser* of 1897 upon wages of agricultural

servants and laborers in Denmark. These figures are made up from returns from 70 per cent of the farmers' associations, together with special reports from 150 employers of labor in agriculture or lumber industries.

The average pay for so-called agricultural servants is: —

	Men.	Women.
Summer pay, ...	$41.31	$23.49
Winter "	20.52	15.39

The cost of living is rated for men and women at 15.9 and 14.6 cents per diem, respectively. Wage figures vary considerably, those of a man's annual wage ranging from $55.35 to $68.85; wages also vary with the several classes of servants. Housemaids receive a little less than $74 per year, besides board; a farmer's head servant is paid as high as $121.50, besides board.

Servants' remuneration had risen in 1897, 14 per cent over 1892 and 80 per cent over the early seventies; corresponding figures for the rise of women's wages are 11 per cent and 103 per cent.

Regular day-laborers, living at their own cost, receive about $0.47 a day in spring and summer (110 days), $0.61 in autumn (40 days), and $0.37 in winter (150 days). Corresponding figures for those whose living is furnished them, are $0.32, $0.45, and $0.21. In the case of the regular laborers the year's pay is reckoned on the average (special labor being included) as $144.18; this figure becomes $93.15 when workmen are boarded. Temporary labor receives a slightly higher wage than does regular labor.

The Danish inspector of societies for aid in sickness reports their number as 902 at the end of 1898, of which 64 are located in Copenhagen, 73 in other cities, and 748 in the country.* The membership approaches 231,000; in the cities more than half of the members are men, while in the country the sexes are about equally represented. The property of these 902 societies, deducting debts, is valued at $513,000; the state contribution for 1898 brought this up to $702,000.

Income in 1898 was $594,000; in the country one-half of this income is derived from members, in Copenhagen one-fourth. Gifts, surpluses from fêtes, etc., play a great role in the country. Outlay

* *Nationalökonomisk Tidsskrift*, 1ste Hefte, 1900.

amounted to about $540,000, of which 38 per cent was expended in financial aid for the sick, 35 per cent for medical attendance, and 12 per cent for medicine. In the cities, the percentage of expense for financial aid is from 40 to 45 per cent. The average annual expense per member is a little over $0.80 for medical attendance and about $0.55 for medicine.

Days of sickness per member (male and female) are given in the following table of averages; the figures are less for 1898 which was a remarkably good year: —

	Men.	Women.
In Copenhagen associations,	7.5	5.0
" country-town "	6.6	5.1
" island-district "	4.1	4.6
" Jylland "	3.3	4.1

Male members in the Copenhagen societies have assured themselves a daily wage during enforced idleness, as shown by the following table; they are in this respect more prudent than members of societies in smaller cities and in the country: —

Insured for less than 27 cents per day,	11.4 per cent
" " 27 cents per day,	39.0 " "
" " 27 to 54 cents per day,	30.7 " "
" " 54 cents per day,	18.3 " "
" " over 54 cents per day,	0.6 " "

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